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(21) International Application Number: PCT/US00/05308 (22) International Filing Date: 15 February 2000 (15.02.00) (30) Priority Data: 09/285,480 2 April 1999 (02.04.99) US 09/339,338 23 June 1999 (23.06.99) US 09/389,681 2 September 1999 (02.09.99) US 09/433,826 3 November 1999 (03.11.99) US (71) Applicant (for all designated States except US): CORIXA CORPORATION [US/US]; 1124 Columbia Street, Suite 200, Seattle, WA 98104 (US). (72) Inventors; and (75) Inventors/Applicants (for US only): YUQIU, Jiang [CN/US]; 5001 South 232nd Street, Kent, WA 98032 (US). DILLON, Davin, C. [US/US]; 21607 N.E. 24th Street, Redmond, WA 98053 (US). MITCHAM, Jennifer, Lynn [US/US]; 16677 Northeast 88th Street, Redmond, WA 98052 (US). XU, Jiangchun [US/US]; 15805 S.E. 43rd Place, Bellevue, WA 98006 (US). HARLOCKER, Susan, L. [US/US]; 1124 Columbia Street, Suite 200, Seattle, WA 98104 (US).	(74) Agents: MAKI, David, J. et al.; Seed Intellectual Property Law Group PLLC, Suite 6300, 701 Fifth Avenue, Seattle, WA 98104-7092 (US). (81) Designated States: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG). Published <i>Without international search report and to be republished upon receipt of that report.</i>	
(54) Title: COMPOSITIONS FOR THE TREATMENT AND DIAGNOSIS OF BREAST CANCER AND METHODS FOR THEIR USE (57) Abstract Compositions and methods for the therapy and diagnosis of cancer, such as breast cancer, are disclosed. Compositions may comprise one or more breast tumor proteins, immunogenic portions thereof, or polynucleotides that encode such portions. Alternatively, a therapeutic composition may comprise an antigen presenting cell that expresses a breast tumor protein, or a T cell that is specific for cells expressing such a protein. Such compositions may be used, for example, for the prevention and treatment of diseases such as breast cancer. Diagnostic methods based on detecting a breast tumor protein, or mRNA encoding such a protein, in a sample are also provided.		

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COMPOSITIONS FOR THE TREATMENT AND DIAGNOSIS OF BREAST CANCER AND METHODS FOR THEIR USE

TECHNICAL FIELD

The present invention relates generally to compositions and methods for the treatment of breast cancer. The invention is more particularly related to polypeptides comprising at least a portion of a protein that is preferentially expressed in breast tumor tissue and to polynucleotides encoding such polypeptides. Such polypeptides and polynucleotides may be used in vaccines and pharmaceutical compositions for treatment of breast cancer.

BACKGROUND OF THE INVENTION

Breast cancer is a significant health problem for women in the United States and throughout the world. Although advances have been made in detection and treatment of the disease, breast cancer remains the second leading cause of cancer-related deaths in women, affecting more than 180,000 women in the United States each year. For women in North America, the life-time odds of getting breast cancer are one in eight.

No vaccine or other universally successful method for the prevention or treatment of breast cancer is currently available. Management of the disease currently relies on a combination of early diagnosis (through routine breast screening procedures) and aggressive treatment, which may include one or more of a variety of treatments such as surgery, radiotherapy, chemotherapy and hormone therapy. The course of treatment for a particular breast cancer is often selected based on a variety of prognostic parameters, including an analysis of specific tumor markers. *See, e.g.,* Porter-Jordan and Lippman, *Breast Cancer* 8:73-100 (1994). However, the use of established markers often leads to a result that is difficult to interpret, and the high mortality observed in breast cancer patients indicates that improvements are needed in the treatment, diagnosis and prevention of the disease.

Accordingly, there is a need in the art for improved methods for the treatment and diagnosis of breast cancer. The present invention fulfills these needs and further provides other related advantages.

SUMMARY OF THE INVENTION

The present invention provides compounds and methods for the treatment and diagnosis of cancer, such as breast cancer. In one aspect, isolated polypeptides are provided comprising at least a portion of a breast tumor protein or a variant thereof. Certain portions and other variants are immunogenic, such that the ability of the variant to react with protein-specific antisera is not substantially diminished. With certain embodiments, the polypeptide comprises an amino acid sequence encoded by a polynucleotide selected from the group consisting of: (a) nucleotide sequences recited in SEQ ID NO: 1-61, 63-175, 178, 180, 182-313, 320-324, 342, 353, 366-368, 377, 382, 385, 389, 395, 397, 400, 408, 411, 413, 414, 416, 417, 419-423, 426, 427, 429, 431, 435-438, 441, 443-446, 450, 453, 454 and 463-468; (b) complements of said nucleotide sequences; and (c) variants of a sequence of (a) or (b). In specific embodiments, the inventive polypeptides comprise at least a portion of a tumor antigen that comprises an amino acid sequence selected from the group consisting of SEQ ID NO: 62, 176, 179, 181 and 469-473.

In related aspects, isolated polynucleotides encoding the above polypeptides, or a portion thereof (such as a portion encoding at least 15 contiguous amino acid residues of a breast tumor protein), are provided. In specific embodiments, such polynucleotides comprise a sequence selected from the group consisting of sequences provided in SEQ ID NO: 1-61, 63-175, 178, 180, 182-313, 320-324, 342, 353, 366-368, 377, 382, 385, 389, 395, 397, 400, 408, 411, 413, 414, 416, 417, 419-423, 426, 427, 429, 431, 435-438, 441, 443-446, 450, 453, 454 and 463-468 and variants thereof. The present invention further provides expression vectors comprising the above polynucleotides, together with host cells transformed or transfected with such expression vectors. In preferred embodiments, the host cells are selected from the group consisting of *E. coli*, yeast and mammalian cells.

In another aspect, the present invention provides fusion proteins comprising a first and a second inventive polypeptide or, alternatively, an inventive polypeptide and a known breast tumor antigen.

The present invention also provides pharmaceutical compositions comprising at least one of the above polypeptides, or a polynucleotide encoding such a polypeptide, and a physiologically acceptable carrier, together with vaccines. For prophylactic or therapeutic use, comprising at least one such polypeptide or polynucleotide in combination with an immunostimulant. Pharmaceutical compositions and vaccines comprising one or more of the above fusion proteins are also provided.

The present invention further provides pharmaceutical compositions that comprise: (a) an antibody or antigen-binding fragment thereof that specifically binds to a breast tumor protein; and (b) a physiologically acceptable carrier.

Within further aspects, the present invention provides pharmaceutical compositions comprising: (a) an antigen presenting cell that expresses a polypeptide as described above and (b) a pharmaceutically acceptable carrier or excipient. Antigen presenting cells include dendritic cells, macrophages, monocytes, fibroblasts and B cells.

Within related aspects, vaccines are provided that comprise: (a) an antigen presenting cell that expresses a polypeptide as described above and (b) an immunostimulant.

In yet another aspect, methods are provided for inhibiting the development of breast cancer in a patient, comprising administering an effective amount of at least one of the above pharmaceutical compositions and/or vaccines.

The present invention further provides, within other aspects, methods for removing tumor cells from a biological sample, comprising contacting a biological sample with T cells that specifically react with a breast tumor protein, wherein the step of contacting is performed under conditions and for a time sufficient to permit the removal of cells expressing the protein from the sample.

Within related aspects, methods are provided for inhibiting the development of a cancer in a patient, comprising administering to a patient a biological sample treated as described above.

Methods are further provided, within other aspects, for stimulating and/or expanding T cells specific for a breast tumor protein, comprising contacting T cells with one or more of: (i) a polypeptide as described above; (ii) a polynucleotide encoding such a polypeptide; and/or (iii) an antigen presenting cell that expresses such a polypeptide;

under conditions and for a time sufficient to permit the stimulation and/or expansion of T cells. Isolated T cell populations comprising T cells prepared as described above are also provided.

Within further aspects, the present invention provides methods for inhibiting the development of a cancer in a patient, comprising administering to a patient an effective amount of a T cell population as described above.

The present invention further provides methods for inhibiting the development of a cancer in a patient, comprising the steps of: (a) incubating CD4⁺ and/or CD8⁺ T cells isolated from a patient with one or more of: (i) a polypeptide comprising at least an immunogenic portion of a breast tumor protein; (ii) a polynucleotide encoding such a polypeptide; and (iii) an antigen-presenting cell that expressed such a polypeptide; and (b) administering to the patient an effective amount of the proliferated T cells, and thereby inhibiting the development of a cancer in the patient. Proliferated cells may, but need not, be cloned prior to administration to the patient.

The polypeptides disclosed herein may be usefully employed in the diagnosis and monitoring of breast cancer. In one aspect of the present invention, methods are provided for detecting a cancer in a patient, comprising: (a) contacting a biological sample obtained from a patient with a binding agent that is capable of binding to one of the above polypeptides; and (b) detecting in the sample an amount of polypeptide that binds to the binding agent; and (c) comparing the amount of polypeptide with a predetermined cut-off value, and therefrom determining the presence or absence of a cancer in a patient. In preferred embodiments, the binding agent is an antibody, most preferably a monoclonal antibody. The cancer may be breast cancer.

In related aspects, methods are provided for monitoring the progression of a cancer in a patient, comprising: (a) contacting a biological sample obtained from a patient with a binding agent that is capable of binding to one of the above polypeptides; (b) detecting in the sample an amount of a polypeptide that binds to the binding agent; (c) repeating steps (a) and (b) using a biological sample obtained from the patient at a subsequent point in time; and (d) comparing the amounts of polypeptide detected in steps (b) and (c).

Within related aspects, the present invention provides antibodies, preferably monoclonal antibodies, that bind to the inventive polypeptides, as well as diagnostic kits comprising such antibodies, and methods of using such antibodies to inhibit the development of breast cancer.

The present invention further provides, within other aspects, methods for determining the presence or absence of a cancer in a patient, comprising the steps of: (a) contacting a biological sample obtained from a patient with an oligonucleotide that hybridizes to a polynucleotide that encodes a breast tumor protein; (b) detecting in the sample a level of a polynucleotide, preferably mRNA, that hybridizes to the oligonucleotide; and (c) comparing the level of polynucleotide that hybridizes to the oligonucleotide with a predetermined cut-off value, and therefrom determining the presence or absence of a cancer in the patient. Within certain embodiments, the amount of mRNA is detected via polymerase chain reaction using, for example, at least one oligonucleotide primer that hybridizes to a polynucleotide encoding a polypeptide as recited above, or a complement of such a polynucleotide. Within other embodiments, the amount of mRNA is detected using a hybridization technique, employing an oligonucleotide probe that hybridizes to a polynucleotide that encodes a polypeptide as recited above, or a complement of such a polynucleotide.

In related aspects, diagnostic kits comprising the above oligonucleotide probes or primers are provided.

These and other aspects of the present invention will become apparent upon reference to the following detailed description. All references disclosed herein are hereby incorporated by reference in their entirety as if each was incorporated individually.

BRIEF DESCRIPTION OF THE DRAWING AND SEQUENCE IDENTIFIERS

Fig. 1 shows the results of a Northern blot of the clone SYN18C6 (SEQ ID NO: 40).

SEQ ID NO: 1 is the determined cDNA sequence of JBT2.

SEQ ID NO: 2 is the determined cDNA sequence of JBT6.

SEQ ID NO: 3 is the determined cDNA sequence of JBT7.

SEQ ID NO: 4 is the determined cDNA sequence of JBT10.
SEQ ID NO: 5 is the determined cDNA sequence of JBT13.
SEQ ID NO: 6 is the determined cDNA sequence of JBT14.
SEQ ID NO: 7 is the determined cDNA sequence of JBT15.
SEQ ID NO: 8 is the determined cDNA sequence of JBT16.
SEQ ID NO: 9 is the determined cDNA sequence of JBT17.
SEQ ID NO: 10 is the determined cDNA sequence of JBT22.
SEQ ID NO: 11 is the determined cDNA sequence of JBT25.
SEQ ID NO: 12 is the determined cDNA sequence of JBT28.
SEQ ID NO: 13 is the determined cDNA sequence of JBT32.
SEQ ID NO: 14 is the determined cDNA sequence of JBT33.
SEQ ID NO: 15 is the determined cDNA sequence of JBT34.
SEQ ID NO: 16 is the determined cDNA sequence of JBT36.
SEQ ID NO: 17 is the determined cDNA sequence of JBT37.
SEQ ID NO: 18 is the determined cDNA sequence of JBT51.
SEQ ID NO: 19 is the determined cDNA sequence of JBTT1.
SEQ ID NO: 20 is the determined cDNA sequence of JBTT7.
SEQ ID NO: 21 is the determined cDNA sequence of JBTT11.
SEQ ID NO: 22 is the determined cDNA sequence of JBTT14.
SEQ ID NO: 23 is the determined cDNA sequence of JBTT18.
SEQ ID NO: 24 is the determined cDNA sequence of JBTT19.
SEQ ID NO: 25 is the determined cDNA sequence of JBTT20.
SEQ ID NO: 26 is the determined cDNA sequence of JBTT21.
SEQ ID NO: 27 is the determined cDNA sequence of JBTT22.
SEQ ID NO: 28 is the determined cDNA sequence of JBTT28.
SEQ ID NO: 29 is the determined cDNA sequence of JBTT29.
SEQ ID NO: 30 is the determined cDNA sequence of JBTT33.
SEQ ID NO: 31 is the determined cDNA sequence of JBTT37.
SEQ ID NO: 32 is the determined cDNA sequence of JBTT38.
SEQ ID NO: 33 is the determined cDNA sequence of JBTT47.
SEQ ID NO: 34 is the determined cDNA sequence of JBTT48.

SEQ ID NO: 35 is the determined cDNA sequence of JBTT50.
SEQ ID NO: 36 is the determined cDNA sequence of JBTT51.
SEQ ID NO: 37 is the determined cDNA sequence of JBTT52.
SEQ ID NO: 38 is the determined cDNA sequence of JBTT54.
SEQ ID NO: 39 is the determined cDNA sequence of SYN17F4.
SEQ ID NO: 40 is the determined cDNA sequence of SYN18C6.
SEQ ID NO: 41 is the determined cDNA sequence of SYN19A2.
SEQ ID NO: 42 is the determined cDNA sequence of SYN19C8.
SEQ ID NO: 43 is the determined cDNA sequence of SYN20A12.
SEQ ID NO: 44 is the determined cDNA sequence of SYN20G6.
SEQ ID NO: 45 is the determined cDNA sequence of SYN20G6-2.
SEQ ID NO: 46 is the determined cDNA sequence of SYN21B9.
SEQ ID NO: 47 is the determined cDNA sequence of SYN21B9-2.
SEQ ID NO: 48 is the determined cDNA sequence of SYN21C10.
SEQ ID NO: 49 is the determined cDNA sequence of SYN21G10.
SEQ ID NO: 50 is the determined cDNA sequence of SYN21G10-2.
SEQ ID NO: 51 is the determined cDNA sequence of SYN21G11.
SEQ ID NO: 52 is the determined cDNA sequence of SYN21G11-2.
SEQ ID NO: 53 is the determined cDNA sequence of SYN21H8.
SEQ ID NO: 54 is the determined cDNA sequence of SYN22A10.
SEQ ID NO: 55 is the determined cDNA sequence of SYN22A10-2.
SEQ ID NO: 56 is the determined cDNA sequence of SYN22A12.
SEQ ID NO: 57 is the determined cDNA sequence of SYN22A2.
SEQ ID NO: 58 is the determined cDNA sequence of SYN22B4.
SEQ ID NO: 59 is the determined cDNA sequence of SYN22C2.
SEQ ID NO: 60 is the determined cDNA sequence of SYN22E10.
SEQ ID NO: 61 is the determined cDNA sequence of SYN22F2.
SEQ ID NO: 62 is a predicted amino acid sequence for SYN18C6.
SEQ ID NO: 63 is the determined cDNA sequence of B723P.
SEQ ID NO: 64 is the determined cDNA sequence for B724P.
SEQ ID NO: 65 is the determined cDNA sequence of B770P.

SEQ ID NO: 66 is the determined cDNA sequence of B716P.

SEQ ID NO: 67 is the determined cDNA sequence of B725P.

SEQ ID NO: 68 is the determined cDNA sequence of B717P.

SEQ ID NO: 69 is the determined cDNA sequence of B771P.

SEQ ID NO: 70 is the determined cDNA sequence of B722P.

SEQ ID NO: 71 is the determined cDNA sequence of B726P.

SEQ ID NO: 72 is the determined cDNA sequence of B727P.

SEQ ID NO: 73 is the determined cDNA sequence of B728P.

SEQ ID NO: 74-87 are the determined cDNA sequences of isolated clones which show homology to known sequences.

SEQ ID NO: 88 is the determined cDNA sequence of 13053.

SEQ ID NO: 89 is the determined cDNA sequence of 13057.

SEQ ID NO: 90 is the determined cDNA sequence of 13059.

SEQ ID NO: 91 is the determined cDNA sequence of 13065.

SEQ ID NO: 92 is the determined cDNA sequence of 13067.

SEQ ID NO: 93 is the determined cDNA sequence of 13068.

SEQ ID NO: 94 is the determined cDNA sequence of 13071.

SEQ ID NO: 95 is the determined cDNA sequence of 13072.

SEQ ID NO: 96 is the determined cDNA sequence of 13073.

SEQ ID NO: 97 is the determined cDNA sequence of 13075.

SEQ ID NO: 98 is the determined cDNA sequence of 13078.

SEQ ID NO: 99 is the determined cDNA sequence of 13079.

SEQ ID NO: 100 is the determined cDNA sequence of 13081.

SEQ ID NO: 101 is the determined cDNA sequence of 13082.

SEQ ID NO: 102 is the determined cDNA sequence of 13092.

SEQ ID NO: 103 is the determined cDNA sequence of 13097.

SEQ ID NO: 104 is the determined cDNA sequence of 13101.

SEQ ID NO: 105 is the determined cDNA sequence of 13102.

SEQ ID NO: 106 is the determined cDNA sequence of 13119.

SEQ ID NO: 107 is the determined cDNA sequence of 13131.

SEQ ID NO: 108 is the determined cDNA sequence of 13133.

SEQ ID NO: 109 is the determined cDNA sequence of 13135.
SEQ ID NO: 110 is the determined cDNA sequence of 13139.
SEQ ID NO: 111 is the determined cDNA sequence of 13140.
SEQ ID NO: 112 is the determined cDNA sequence of 13146.
SEQ ID NO: 113 is the determined cDNA sequence of 13147.
SEQ ID NO: 114 is the determined cDNA sequence of 13148.
SEQ ID NO: 115 is the determined cDNA sequence of 13149.
SEQ ID NO: 116 is the determined cDNA sequence of 13151.
SEQ ID NO: 117 is the determined cDNA sequence of 13051
SEQ ID NO: 118 is the determined cDNA sequence of 13052
SEQ ID NO: 119 is the determined cDNA sequence of 13055
SEQ ID NO: 120 is the determined cDNA sequence of 13058
SEQ ID NO: 121 is the determined cDNA sequence of 13062
SEQ ID NO: 122 is the determined cDNA sequence of 13064
SEQ ID NO: 123 is the determined cDNA sequence of 13080
SEQ ID NO: 124 is the determined cDNA sequence of 13093
SEQ ID NO: 125 is the determined cDNA sequence of 13094
SEQ ID NO: 126 is the determined cDNA sequence of 13095
SEQ ID NO: 127 is the determined cDNA sequence of 13096
SEQ ID NO: 128 is the determined cDNA sequence of 13099
SEQ ID NO: 129 is the determined cDNA sequence of 13100
SEQ ID NO: 130 is the determined cDNA sequence of 13103
SEQ ID NO: 131 is the determined cDNA sequence of 13106
SEQ ID NO: 132 is the determined cDNA sequence of 13107
SEQ ID NO: 133 is the determined cDNA sequence of 13108
SEQ ID NO: 134 is the determined cDNA sequence of 13121
SEQ ID NO: 135 is the determined cDNA sequence of 13126
SEQ ID NO: 136 is the determined cDNA sequence of 13129
SEQ ID NO: 137 is the determined cDNA sequence of 13130
SEQ ID NO: 138 is the determined cDNA sequence of 13134
SEQ ID NO: 139 is the determined cDNA sequence of 13141

SEQ ID NO: 140 is the determined cDNA sequence of 13142
SEQ ID NO: 141 is the determined cDNA sequence of 14376
SEQ ID NO: 142 is the determined cDNA sequence of 14377
SEQ ID NO: 143 is the determined cDNA sequence of 14383
SEQ ID NO: 144 is the determined cDNA sequence of 14384
SEQ ID NO: 145 is the determined cDNA sequence of 14387
SEQ ID NO: 146 is the determined cDNA sequence of 14392
SEQ ID NO: 147 is the determined cDNA sequence of 14394
SEQ ID NO: 148 is the determined cDNA sequence of 14398
SEQ ID NO: 149 is the determined cDNA sequence of 14401
SEQ ID NO: 150 is the determined cDNA sequence of 14402
SEQ ID NO: 151 is the determined cDNA sequence of 14405
SEQ ID NO: 152 is the determined cDNA sequence of 14409
SEQ ID NO: 153 is the determined cDNA sequence of 14412
SEQ ID NO: 154 is the determined cDNA sequence of 14414
SEQ ID NO: 155 is the determined cDNA sequence of 14415
SEQ ID NO: 156 is the determined cDNA sequence of 14416
SEQ ID NO: 157 is the determined cDNA sequence of 14419
SEQ ID NO: 158 is the determined cDNA sequence of 14426
SEQ ID NO: 159 is the determined cDNA sequence of 14427
SEQ ID NO: 160 is the determined cDNA sequence of 14375
SEQ ID NO: 161 is the determined cDNA sequence of 14378
SEQ ID NO: 162 is the determined cDNA sequence of 14379
SEQ ID NO: 163 is the determined cDNA sequence of 14380
SEQ ID NO: 164 is the determined cDNA sequence of 14381
SEQ ID NO: 165 is the determined cDNA sequence of 14382
SEQ ID NO: 166 is the determined cDNA sequence of 14388
SEQ ID NO: 167 is the determined cDNA sequence of 14399
SEQ ID NO: 168 is the determined cDNA sequence of 14406
SEQ ID NO: 169 is the determined cDNA sequence of 14407
SEQ ID NO: 170 is the determined cDNA sequence of 14408

SEQ ID NO: 171 is the determined cDNA sequence of 14417

SEQ ID NO: 172 is the determined cDNA sequence of 14418

SEQ ID NO: 173 is the determined cDNA sequence of 14423

SEQ ID NO: 174 is the determined cDNA sequence of 14424

SEQ ID NO: 175 is the determined cDNA sequence of B726P-20

SEQ ID NO: 176 is the predicted amino acid sequence of B726P-20

SEQ ID NO: 177 is a PCR primer

SEQ ID NO: 178 is the determined cDNA sequence of B726P-74

SEQ ID NO: 179 is the predicted amino acid sequence of B726P-74

SEQ ID NO: 180 is the determined cDNA sequence of B726P-79

SEQ ID NO: 181 is the predicted amino acid sequence of B726P-79

SEQ ID NO: 182 is the determined cDNA sequence of 19439.1, showing
homology to the mammaglobin gene

SEQ ID NO: 183 is the determined cDNA sequence of 19407.1, showing
homology to the human keratin gene

SEQ ID NO: 184 is the determined cDNA sequence of 19428.1, showing
homology to human chromosome 17 clone

SEQ ID NO: 185 is the determined cDNA sequence of B808P (19408),
showing no significant homology to any known gene

SEQ ID NO: 186 is the determined cDNA sequence of 19460.1, showing
no significant homology to any known gene

SEQ ID NO: 187 is the determined cDNA sequence of 19419.1, showing
homology to Ig kappa light chain

SEQ ID NO: 188 is the determined cDNA sequence of 19411.1, showing
homology to human alpha-1 collagen

SEQ ID NO: 189 is the determined cDNA sequence of 19420.1, showing
homology to mus musculus proteinase-3

SEQ ID NO: 190 is the determined cDNA sequence of 19432.1, showing
homology to human high motility group box

SEQ ID NO: 191 is the determined cDNA sequence of 19412.1, showing
homology to the human plasminogen activator gene

SEQ ID NO: 192 is the determined cDNA sequence of 19415.1, showing homology to mitogen activated protein kinase

SEQ ID NO: 193 is the determined cDNA sequence of 19409.1, showing homology to the chondroitin sulfate proteoglycan protein

SEQ ID NO: 194 is the determined cDNA sequence of 19406.1, showing no significant homology to any known gene

SEQ ID NO: 195 is the determined cDNA sequence of 19421.1, showing homology to human fibronectin

SEQ ID NO: 196 is the determined cDNA sequence of 19426.1, showing homology to the retinoic acid receptor responder 3

SEQ ID NO: 197 is the determined cDNA sequence of 19425.1, showing homology to MyD88 mRNA

SEQ ID NO: 198 is the determined cDNA sequence of 19424.1, showing homology to peptide transporter (TAP-1) mRNA

SEQ ID NO: 199 is the determined cDNA sequence of 19429.1, showing no significant homology to any known gene

SEQ ID NO: 200 is the determined cDNA sequence of 19435.1, showing homology to human polymorphic epithelial mucin

SEQ ID NO: 201 is the determined cDNA sequence of B813P (19434.1), showing homology to human GATA-3 transcription factor

SEQ ID NO: 202 is the determined cDNA sequence of 19461.1, showing homology to the human AP-2 gene

SEQ ID NO: 203 is the determined cDNA sequence of 19450.1, showing homology to DNA binding regulatory factor

SEQ ID NO: 204 is the determined cDNA sequence of 19451.1, showing homology to Na/H exchange regulatory co-factor

SEQ ID NO: 205 is the determined cDNA sequence of 19462.1, showing no significant homology to any known gene

SEQ ID NO: 206 is the determined cDNA sequence of 19455.1, showing homology to human mRNA for histone HAS.Z

SEQ ID NO: 207 is the determined cDNA sequence of 19459.1, showing

homology to PAC clone 179N16

SEQ ID NO: 208 is the determined cDNA sequence of 19464.1, showing no significant homology to any known gene

SEQ ID NO: 209 is the determined cDNA sequence of 19414.1, showing homology to lipophilin B

SEQ ID NO: 210 is the determined cDNA sequence of 19413.1, showing homology to chromosome 17 clone hRPK.209_J_20

SEQ ID NO: 211 is the determined cDNA sequence of 19416.1, showing no significant homology to any known gene

SEQ ID NO: 212 is the determined cDNA sequence of 19437.1, showing homology to human clone 24976 mRNA

SEQ ID NO: 213 is the determined cDNA sequence of 19449.1, showing homology to mouse DNA for PG-M core protein

SEQ ID NO: 214 is the determined cDNA sequence of 19446.1, showing no significant homology to any known gene

SEQ ID NO: 215 is the determined cDNA sequence of 19452.1, showing no significant homology to any known gene

SEQ ID NO: 216 is the determined cDNA sequence of 19483.1, showing no significant homology to any known gene

SEQ ID NO: 217 is the determined cDNA sequence of 19526.1, showing homology to human lipophilin C

SEQ ID NO: 218 is the determined cDNA sequence of 19484.1, showing homology to the secreted cement gland protein XAG-2

SEQ ID NO: 219 is the determined cDNA sequence of 19470.1, showing no significant homology to any known gene

SEQ ID NO: 220 is the determined cDNA sequence of 19469.1, showing homology to the human HLA-DM gene

SEQ ID NO: 221 is the determined cDNA sequence of 19482.1, showing homology to the human pS2 protein gene

SEQ ID NO: 222 is the determined cDNA sequence of B805P (19468.1), showing no significant homology to any known gene

SEQ ID NO: 223 is the determined cDNA sequence of 19467.1, showing homology to human thrombospondin mRNA

SEQ ID NO: 224 is the determined cDNA sequence of 19498.1, showing homology to the CDC2 gene involved in cell cycle control

SEQ ID NO: 225 is the determined cDNA sequence of 19506.1, showing homology to human cDNA for TREB protein

SEQ ID NO: 226 is the determined cDNA sequence of B806P (19505.1), showing no significant homology to any known gene

SEQ ID NO: 227 is the determined cDNA sequence of 19486.1, showing homology to type I epidermal keratin

SEQ ID NO: 228 is the determined cDNA sequence of 19510.1, showing homology to glucose transporter for glycoprotein

SEQ ID NO: 229 is the determined cDNA sequence of 19512.1, showing homology to the human lysyl hydroxylase gene

SEQ ID NO: 230 is the determined cDNA sequence of 19511.1, showing homology to human palmitoyl-protein thioesterase

SEQ ID NO: 231 is the determined cDNA sequence of 19508.1, showing homology to human alpha enolase

SEQ ID NO: 232 is the determined cDNA sequence of B807P (19509.1), showing no significant homology to any known gene

SEQ ID NO: 233 is the determined cDNA sequence of B809P (19520.1), showing homology to clone 102D24 on chromosome 11q13.31

SEQ ID NO: 234 is the determined cDNA sequence of 19507.1, showing homology to prosome beta-subunit

SEQ ID NO: 235 is the determined cDNA sequence of 19525.1, showing homology to human pro-urokinase precursor

SEQ ID NO: 236 is the determined cDNA sequence of 19513.1, showing no significant homology to any known gene

SEQ ID NO: 237 is the determined cDNA sequence of 19517.1, showing homology to human PAC 128M19 clone

SEQ ID NO: 238 is the determined cDNA sequence of 19564.1, showing

homology to human cytochrome P450-IIIB

SEQ ID NO: 239 is the determined cDNA sequence of 19553.1, showing homology to human GABA-A receptor pi subunit

SEQ ID NO: 240 is the determined cDNA sequence of B811P (19575.1), showing no significant homology to any known gene

SEQ ID NO: 241 is the determined cDNA sequence of B810P (19560.1), showing no significant homology to any known gene

SEQ ID NO: 242 is the determined cDNA sequence of 19588.1, showing homology to aortic carboxypeptidase-like protein

SEQ ID NO: 243 is the determined cDNA sequence of 19551.1, showing homology to human BCL-1 gene

SEQ ID NO: 244 is the determined cDNA sequence of 19567.1, showing homology to human proteasome-related mRNA

SEQ ID NO: 245 is the determined cDNA sequence of B803P (19583.1), showing no significant homology to any known gene

SEQ ID NO: 246 is the determined cDNA sequence of B812P (19587.1), showing no significant homology to any known gene

SEQ ID NO: 247 is the determined cDNA sequence of B802P (19392.2), showing homology to human chromosome 17

SEQ ID NO: 248 is the determined cDNA sequence of 19393.2, showing homology to human nicein B2 chain

SEQ ID NO: 249 is the determined cDNA sequence of 19398.2, human MHC class II DQ alpha mRNA

SEQ ID NO: 250 is the determined cDNA sequence of B804P (19399.2), showing homology to human Xp22 BAC GSHB-184P14

SEQ ID NO: 251 is the determined cDNA sequence of 19401.2, showing homology to human ikB kinase-b gene

SEQ ID NO: 252 is the determined cDNA sequence of 20266, showing no significant homology to any known gene

SEQ ID NO: 253 is the determined cDNA sequence of B826P (20270), showing no significant homology to any known gene

SEQ ID NO: 254 is the determined cDNA sequence of 20274, showing no significant homology to any known gene

SEQ ID NO: 255 is the determined cDNA sequence of 20276, showing no significant homology to any known gene

SEQ ID NO: 256 is the determined cDNA sequence of 20277, showing no significant homology to any known gene

SEQ ID NO: 257 is the determined cDNA sequence of B823P (20280), showing no significant homology to any known gene

SEQ ID NO: 258 is the determined cDNA sequence of B821P (20281), showing no significant homology to any known gene

SEQ ID NO: 259 is the determined cDNA sequence of B824P (20294), showing no significant homology to any known gene

SEQ ID NO: 260 is the determined cDNA sequence of 20303, showing no significant homology to any known gene

SEQ ID NO: 261 is the determined cDNA sequence of B820P (20310), showing no significant homology to any known gene

SEQ ID NO: 262 is the determined cDNA sequence of B825P (20336), showing no significant homology to any known gene

SEQ ID NO: 263 is the determined cDNA sequence of B827P (20341), showing no significant homology to any known gene

SEQ ID NO: 264 is the determined cDNA sequence of 20941, showing no significant homology to any known gene

SEQ ID NO: 265 is the determined cDNA sequence of 20954, showing no significant homology to any known gene

SEQ ID NO: 266 is the determined cDNA sequence of 20961, showing no significant homology to any known gene

SEQ ID NO: 267 is the determined cDNA sequence of 20965, showing no significant homology to any known gene

SEQ ID NO: 268 is the determined cDNA sequence of 20975, showing no significant homology to any known gene

SEQ ID NO: 269 is the determined cDNA sequence of 20261, showing

homology to Human p120 catenin

SEQ ID NO: 270 is the determined cDNA sequence of B822P (20262), showing homology to Human membrane glycoprotein 4F2

SEQ ID NO: 271 is the determined cDNA sequence of 20265, showing homology to Human Na, K-ATPase Alpha 1

SEQ ID NO: 272 is the determined cDNA sequence of 20267, showing homology to Human heart HS 90, partial cds

SEQ ID NO: 273 is the determined cDNA sequence of 20268, showing homology to Human mRNA GPI-anchored protein p137

SEQ ID NO: 274 is the determined cDNA sequence of 20271, showing homology to Human cleavage stimulation factor 77 kDa subunit

SEQ ID NO: 275 is the determined cDNA sequence of 20272, showing homology to Human p190-B

SEQ ID NO: 276 is the determined cDNA sequence of 20273, showing homology to Human ribophorin

SEQ ID NO: 277 is the determined cDNA sequence of 20278, showing homology to Human ornithine amino transferase

SEQ ID NO: 278 is the determined cDNA sequence of 20279, showing homology to Human S-adenosylmethionine synthetase

SEQ ID NO: 279 is the determined cDNA sequence of 20293, showing homology to Human x inactivation transcript

SEQ ID NO: 280 is the determined cDNA sequence of 20300, showing homology to Human cytochrome p450

SEQ ID NO: 281 is the determined cDNA sequence of 20305, showing homology to Human elongation factor-1 alpha

SEQ ID NO: 282 is the determined cDNA sequence of 20306, showing homology to Human epithelial ets protein

SEQ ID NO: 283 is the determined cDNA sequence of 20307, showing homology to Human signal transducer mRNA

SEQ ID NO: 284 is the determined cDNA sequence of 20313, showing homology to Human GABA-A receptor pi subunit mRNA

SEQ ID NO: 285 is the determined cDNA sequence of 20317, showing homology to Human tyrosine phosphatase

SEQ ID NO: 286 is the determined cDNA sequence of 20318, showing homology to Human cathepsin B proteinase

SEQ ID NO: 287 is the determined cDNA sequence of 20320, showing homology to Human 2-phosphopyruvate-hydratase-alpha-enolase

SEQ ID NO: 288 is the determined cDNA sequence of 20321, showing homology to Human E-cadherin

SEQ ID NO: 289 is the determined cDNA sequence of 20322, showing homology to Human hsp86

SEQ ID NO: 290 is the determined cDNA sequence of B828P (20326), showing homology to Human x inactivation transcript

SEQ ID NO: 291 is the determined cDNA sequence of 20333, showing homology to Human chromatin regulator, SMARCA5

SEQ ID NO: 292 is the determined cDNA sequence of 20335, showing homology to Human sphingolipid activator protein 1

SEQ ID NO: 293 is the determined cDNA sequence of 20337, showing homology to Human hepatocyte growth factor activator inhibitor type 2

SEQ ID NO: 294 is the determined cDNA sequence of 20338, showing homology to Human cell adhesion molecule CD44

SEQ ID NO: 295 is the determined cDNA sequence of 20340, showing homology to Human nuclear factor (erythroid-derived)-like 1

SEQ ID NO: 296 is the determined cDNA sequence of 20938, showing homology to Human vinculin mRNA

SEQ ID NO: 297 is the determined cDNA sequence of 20939, showing homology to Human elongation factor EF-1-alpha

SEQ ID NO: 298 is the determined cDNA sequence of 20940, showing homology to Human nestin gene

SEQ ID NO: 299 is the determined cDNA sequence of 20942, showing homology to Human pancreatic ribonuclease

SEQ ID NO: 300 is the determined cDNA sequence of 20943, showing

homology to Human transcobalamin I

SEQ ID NO: 301 is the determined cDNA sequence of 20944, showing homology to Human beta-tubulin

SEQ ID NO: 302 is the determined cDNA sequence of 20946, showing homology to Human HS1 protein

SEQ ID NO: 303 is the determined cDNA sequence of 20947, showing homology to Human cathepsin B

SEQ ID NO: 304 is the determined cDNA sequence of 20948, showing homology to Human testis enhanced gene transcript

SEQ ID NO: 305 is the determined cDNA sequence of 20949, showing homology to Human elongation factor EF-1-alpha

SEQ ID NO: 306 is the determined cDNA sequence of 20950, showing homology to Human ADP-ribosylation factor 3

SEQ ID NO: 307 is the determined cDNA sequence of 20951, showing homology to Human IFP53 or WRS for tryptophanyl-tRNA synthetase

SEQ ID NO: 308 is the determined cDNA sequence of 20952, showing homology to Human cyclin-dependent protein kinase

SEQ ID NO: 308 is the determined cDNA sequence of 20957, showing homology to Human alpha-tubulin sioform 1

SEQ ID NO: 309 is the determined cDNA sequence of 20959, showing homology to Human tyrosine phosphatase-61bp deletion

SEQ ID NO: 310 is the determined cDNA sequence of 20966, showing homology to Human tyrosine phosphatase

SEQ ID NO: 311 is the determined cDNA sequence of B830P (20976), showing homology to Human nuclear factor NF 45

SEQ ID NO: 312 is the determined cDNA sequence of B829P (20977), showing homology to Human delta-6 fatty acid desaturase

SEQ ID NO: 313 is the determined cDNA sequence of 20978, showing homology to Human nuclear aconitase

SEQ ID NO: 314 is the determined cDNA sequence of 19465, showing no significant homology to any known gene.

SEQ ID NO: 315 is the determined cDNA sequence of clone 23176.
SEQ ID NO: 316 is the determined cDNA sequence of clone 23140.
SEQ ID NO: 317 is the determined cDNA sequence of clone 23166.
SEQ ID NO: 318 is the determined cDNA sequence of clone 23167.
SEQ ID NO: 319 is the determined cDNA sequence of clone 23177.
SEQ ID NO: 320 is the determined cDNA sequence of clone 23217.
SEQ ID NO: 321 is the determined cDNA sequence of clone 23169.
SEQ ID NO: 322 is the determined cDNA sequence of clone 23160.
SEQ ID NO: 323 is the determined cDNA sequence of clone 23182.
SEQ ID NO: 324 is the determined cDNA sequence of clone 23232.
SEQ ID NO: 325 is the determined cDNA sequence of clone 23203.
SEQ ID NO: 326 is the determined cDNA sequence of clone 23198.
SEQ ID NO: 327 is the determined cDNA sequence of clone 23224.
SEQ ID NO: 328 is the determined cDNA sequence of clone 23142.
SEQ ID NO: 329 is the determined cDNA sequence of clone 23138.
SEQ ID NO: 330 is the determined cDNA sequence of clone 23147.
SEQ ID NO: 331 is the determined cDNA sequence of clone 23148.
SEQ ID NO: 332 is the determined cDNA sequence of clone 23149.
SEQ ID NO: 333 is the determined cDNA sequence of clone 23172.
SEQ ID NO: 334 is the determined cDNA sequence of clone 23158.
SEQ ID NO: 335 is the determined cDNA sequence of clone 23156.
SEQ ID NO: 336 is the determined cDNA sequence of clone 23221.
SEQ ID NO: 337 is the determined cDNA sequence of clone 23223.
SEQ ID NO: 338 is the determined cDNA sequence of clone 23155.
SEQ ID NO: 339 is the determined cDNA sequence of clone 23225.
SEQ ID NO: 340 is the determined cDNA sequence of clone 23226.
SEQ ID NO: 341 is the determined cDNA sequence of clone 23228.
SEQ ID NO: 342 is the determined cDNA sequence of clone 23229.
SEQ ID NO: 343 is the determined cDNA sequence of clone 23231.
SEQ ID NO: 344 is the determined cDNA sequence of clone 23154.
SEQ ID NO: 345 is the determined cDNA sequence of clone 23157.

SEQ ID NO: 346 is the determined cDNA sequence of clone 23153.
SEQ ID NO: 347 is the determined cDNA sequence of clone 23159.
SEQ ID NO: 348 is the determined cDNA sequence of clone 23152.
SEQ ID NO: 349 is the determined cDNA sequence of clone 23161.
SEQ ID NO: 350 is the determined cDNA sequence of clone 23162.
SEQ ID NO: 351 is the determined cDNA sequence of clone 23163.
SEQ ID NO: 352 is the determined cDNA sequence of clone 23164.
SEQ ID NO: 353 is the determined cDNA sequence of clone 23165.
SEQ ID NO: 354 is the determined cDNA sequence of clone 23151.
SEQ ID NO: 355 is the determined cDNA sequence of clone 23150.
SEQ ID NO: 356 is the determined cDNA sequence of clone 23168.
SEQ ID NO: 357 is the determined cDNA sequence of clone 23146.
SEQ ID NO: 358 is the determined cDNA sequence of clone 23170.
SEQ ID NO: 359 is the determined cDNA sequence of clone 23171.
SEQ ID NO: 360 is the determined cDNA sequence of clone 23145.
SEQ ID NO: 361 is the determined cDNA sequence of clone 23174.
SEQ ID NO: 362 is the determined cDNA sequence of clone 23175.
SEQ ID NO: 363 is the determined cDNA sequence of clone 23144.
SEQ ID NO: 364 is the determined cDNA sequence of clone 23178.
SEQ ID NO: 365 is the determined cDNA sequence of clone 23179.
SEQ ID NO: 366 is the determined cDNA sequence of clone 23180.
SEQ ID NO: 367 is the determined cDNA sequence of clone 23181.
SEQ ID NO: 368 is the determined cDNA sequence of clone 23143.
SEQ ID NO: 369 is the determined cDNA sequence of clone 23183.
SEQ ID NO: 370 is the determined cDNA sequence of clone 23184.
SEQ ID NO: 371 is the determined cDNA sequence of clone 23185.
SEQ ID NO: 372 is the determined cDNA sequence of clone 23186.
SEQ ID NO: 373 is the determined cDNA sequence of clone 23187.
SEQ ID NO: 374 is the determined cDNA sequence of clone 23190.
SEQ ID NO: 375 is the determined cDNA sequence of clone 23189.
SEQ ID NO: 376 is the determined cDNA sequence of clone 23202.

SEQ ID NO: 378 is the determined cDNA sequence of clone 23191.
SEQ ID NO: 379 is the determined cDNA sequence of clone 23188.
SEQ ID NO: 380 is the determined cDNA sequence of clone 23194.
SEQ ID NO: 381 is the determined cDNA sequence of clone 23196.
SEQ ID NO: 382 is the determined cDNA sequence of clone 23195.
SEQ ID NO: 383 is the determined cDNA sequence of clone 23193.
SEQ ID NO: 384 is the determined cDNA sequence of clone 23199.
SEQ ID NO: 385 is the determined cDNA sequence of clone 23200.
SEQ ID NO: 386 is the determined cDNA sequence of clone 23192.
SEQ ID NO: 387 is the determined cDNA sequence of clone 23201.
SEQ ID NO: 388 is the determined cDNA sequence of clone 23141.
SEQ ID NO: 389 is the determined cDNA sequence of clone 23139.
SEQ ID NO: 390 is the determined cDNA sequence of clone 23204.
SEQ ID NO: 391 is the determined cDNA sequence of clone 23205.
SEQ ID NO: 392 is the determined cDNA sequence of clone 23206.
SEQ ID NO: 393 is the determined cDNA sequence of clone 23207.
SEQ ID NO: 394 is the determined cDNA sequence of clone 23208.
SEQ ID NO: 395 is the determined cDNA sequence of clone 23209.
SEQ ID NO: 396 is the determined cDNA sequence of clone 23210.
SEQ ID NO: 397 is the determined cDNA sequence of clone 23211.
SEQ ID NO: 398 is the determined cDNA sequence of clone 23212.
SEQ ID NO: 399 is the determined cDNA sequence of clone 23214.
SEQ ID NO: 400 is the determined cDNA sequence of clone 23215.
SEQ ID NO: 401 is the determined cDNA sequence of clone 23216.
SEQ ID NO: 402 is the determined cDNA sequence of clone 23137.
SEQ ID NO: 403 is the determined cDNA sequence of clone 23218.
SEQ ID NO: 404 is the determined cDNA sequence of clone 23220.
SEQ ID NO: 405 is the determined cDNA sequence of clone 19462.
SEQ ID NO: 406 is the determined cDNA sequence of clone 19430.
SEQ ID NO: 407 is the determined cDNA sequence of clone 19407.
SEQ ID NO: 408 is the determined cDNA sequence of clone 19448.

SEQ ID NO: 409 is the determined cDNA sequence of clone 19447.
SEQ ID NO: 410 is the determined cDNA sequence of clone 19426.
SEQ ID NO: 411 is the determined cDNA sequence of clone 19441.
SEQ ID NO: 412 is the determined cDNA sequence of clone 19454.
SEQ ID NO: 413 is the determined cDNA sequence of clone 19463.
SEQ ID NO: 414 is the determined cDNA sequence of clone 19419.
SEQ ID NO: 415 is the determined cDNA sequence of clone 19434.
SEQ ID NO: 416 is the determined extended cDNA sequence of B820P.
SEQ ID NO: 417 is the determined extended cDNA sequence of B821P.
SEQ ID NO: 418 is the determined extended cDNA sequence of B822P.
SEQ ID NO: 419 is the determined extended cDNA sequence of B823P.
SEQ ID NO: 420 is the determined extended cDNA sequence of B824P.
SEQ ID NO: 421 is the determined extended cDNA sequence of B825P.
SEQ ID NO: 422 is the determined extended cDNA sequence of B826P.
SEQ ID NO: 423 is the determined extended cDNA sequence of B827P.
SEQ ID NO: 424 is the determined extended cDNA sequence of B828P.
SEQ ID NO: 425 is the determined extended cDNA sequence of B829P.
SEQ ID NO: 426 is the determined extended cDNA sequence of B830P.
SEQ ID NO: 427 is the determined cDNA sequence of clone 266B4.
SEQ ID NO: 428 is the determined cDNA sequence of clone 22892.
SEQ ID NO: 429 is the determined cDNA sequence of clone 266G3.
SEQ ID NO: 430 is the determined cDNA sequence of clone 22890.
SEQ ID NO: 431 is the determined cDNA sequence of clone 264B4.
SEQ ID NO: 432 is the determined cDNA sequence of clone 22883.
SEQ ID NO: 433 is the determined cDNA sequence of clone 22882.
SEQ ID NO: 434 is the determined cDNA sequence of clone 22880.
SEQ ID NO: 435 is the determined cDNA sequence of clone 263G1.
SEQ ID NO: 436 is the determined cDNA sequence of clone 263G6.
SEQ ID NO: 437 is the determined cDNA sequence of clone 262B2.
SEQ ID NO: 438 is the determined cDNA sequence of clone 262B6.
SEQ ID NO: 439 is the determined cDNA sequence of clone 22869.

SEQ ID NO: 440 is the determined cDNA sequence of clone 21374.
SEQ ID NO: 441 is the determined cDNA sequence of clone 21362.
SEQ ID NO: 442 is the determined cDNA sequence of clone 21349.
SEQ ID NO: 443 is the determined cDNA sequence of clone 21309.
SEQ ID NO: 444 is the determined cDNA sequence of clone 21097.
SEQ ID NO: 445 is the determined cDNA sequence of clone 21096.
SEQ ID NO: 446 is the determined cDNA sequence of clone 21094.
SEQ ID NO: 447 is the determined cDNA sequence of clone 21093.
SEQ ID NO: 448 is the determined cDNA sequence of clone 21091.
SEQ ID NO: 449 is the determined cDNA sequence of clone 21089.
SEQ ID NO: 450 is the determined cDNA sequence of clone 21087.
SEQ ID NO: 451 is the determined cDNA sequence of clone 21085.
SEQ ID NO: 452 is the determined cDNA sequence of clone 21084.
SEQ ID NO: 453 is a first partial cDNA sequence of clone 2BT1-40.
SEQ ID NO: 454 is a second partial cDNA sequence of clone 2BT1-40.
SEQ ID NO: 455 is the determined cDNA sequence of clone 21063.
SEQ ID NO: 456 is the determined cDNA sequence of clone 21062.
SEQ ID NO: 457 is the determined cDNA sequence of clone 21060.
SEQ ID NO: 458 is the determined cDNA sequence of clone 21053.
SEQ ID NO: 459 is the determined cDNA sequence of clone 21050.
SEQ ID NO: 460 is the determined cDNA sequence of clone 21036.
SEQ ID NO: 461 is the determined cDNA sequence of clone 21037.
SEQ ID NO: 462 is the determined cDNA sequence of clone 21048.
SEQ ID NO: 463 is a consensus DNA sequence of B726P (referred to as

B726P-spliced_seq_B726P).

SEQ ID NO: 464 is the determined cDNA sequence of a second splice form of B726P (referred to as 27490.seq_B726P).

SEQ ID NO: 465 is the determined cDNA sequence of a third splice form of B726P (referred to as 27068.seq_B726P).

SEQ ID NO: 466 is the determined cDNA sequence of a second splice form of B726P (referred to as 23113.seq_B726P).

SEQ ID NO: 467 is the determined cDNA sequence of a second splice form of B726P (referred to as 23103.seq_B726P).

SEQ ID NO: 468 is the determined cDNA sequence of a second splice form of B726P (referred to as 19310.seq_B726P).

SEQ ID NO: 469 is the predicted amino acid sequence encoded by the upstream ORF of SEQ ID NO: 463.

SEQ ID NO: 470 is the predicted amino acid sequence encoded by SEQ ID NO: 464.

SEQ ID NO: 471 is the predicted amino acid sequence encoded by SEQ ID NO: 465.

SEQ ID NO: 472 is the predicted amino acid sequence encoded by SEQ ID NO: 466.

SEQ ID NO: 473 is the predicted amino acid sequence encoded by SEQ ID NO: 467.

DETAILED DESCRIPTION OF THE INVENTION

As noted above, the present invention is generally directed to compositions and methods for the therapy and diagnosis of cancer, such as breast cancer. The compositions described herein may include breast tumor polypeptides, polynucleotides encoding such polypeptides, binding agents such as antibodies, antigen presenting cells (APCs) and/or immune system cells (*e.g.*, T cells). Polypeptides of the present invention generally comprise at least a portion (such as an immunogenic portion) of a breast tumor protein or a variant thereof. A "breast tumor protein" is a protein that is expressed in breast tumor cells at a level that is at least two fold, and preferably at least five fold, greater than the level of expression in a normal tissue, as determined using a representative assay provided herein. Certain breast tumor proteins are tumor proteins that react detectably (within an immunoassay, such as an ELISA or Western blot) with antisera of a patient afflicted with breast cancer. Polynucleotides of the subject invention generally comprise a DNA or RNA sequence that encodes all or a portion of such a polypeptide, or that is complementary to such a sequence. Antibodies are generally immune system proteins, or antigen-binding fragments thereof, that are capable of

binding to a polypeptide as described above. Antigen presenting cells include dendritic cells, macrophages, monocytes, fibroblasts and B-cells that express a polypeptide as described above. T cells that may be employed within such compositions are generally T cells that are specific for a polypeptide as described above.

The present invention is based on the discovery of human breast tumor proteins. Sequences of polynucleotides encoding specific tumor proteins are provided in SEQ ID NOS:1-175, 178, 180 and 182-468.

BREAST TUMOR PROTEIN POLYNUCLEOTIDES

Any polynucleotide that encodes a breast tumor protein or a portion or other variant thereof as described herein is encompassed by the present invention. Preferred polynucleotides comprise at least 15 consecutive nucleotides, preferably at least 30 consecutive nucleotides and more preferably at least 45 consecutive nucleotides, that encode a portion of a breast tumor protein. More preferably, a polynucleotide encodes an immunogenic portion of a breast tumor protein. Polynucleotides complementary to any such sequences are also encompassed by the present invention. Polynucleotides may be single-stranded (coding or antisense) or double-stranded, and may be DNA (genomic, cDNA or synthetic) or RNA molecules. RNA molecules include HnRNA molecules, which contain introns and correspond to a DNA molecule in a one-to-one manner, and mRNA molecules, which do not contain introns. Additional coding or non-coding sequences may, but need not, be present within a polynucleotide of the present invention, and a polynucleotide may, but need not, be linked to other molecules and/or support materials.

Polynucleotides may comprise a native sequence (*i.e.*, an endogenous sequence that encodes a breast tumor protein or a portion thereof) or may comprise a variant of such a sequence. Polynucleotide variants may contain one or more substitutions, additions, deletions and/or insertions such that the immunogenicity of the encoded polypeptide is not diminished, relative to a native tumor protein. The effect on the immunogenicity of the encoded polypeptide may generally be assessed as described herein. Variants preferably exhibit at least about 70% identity, more preferably at least about 80% identity and most preferably at least about 90% identity to a polynucleotide

sequence that encodes a native breast tumor protein or a portion thereof. The term "variants" also encompasses homologous genes of xenogenic origin.

Two polynucleotide or polypeptide sequences are said to be "identical" if the sequence of nucleotides or amino acids in the two sequences is the same when aligned for maximum correspondence as described below. Comparisons between two sequences are typically performed by comparing the sequences over a comparison window to identify and compare local regions of sequence similarity. A "comparison window" as used herein, refers to a segment of at least about 20 contiguous positions, usually 30 to about 75, 40 to about 50, in which a sequence may be compared to a reference sequence of the same number of contiguous positions after the two sequences are optimally aligned.

Optimal alignment of sequences for comparison may be conducted using the Megalign program in the Lasergene suite of bioinformatics software (DNASTAR, Inc., Madison, WI), using default parameters. This program embodies several alignment schemes described in the following references: Dayhoff, M.O. (1978) A model of evolutionary change in proteins – Matrices for detecting distant relationships. In Dayhoff, M.O. (ed.) *Atlas of Protein Sequence and Structure*, National Biomedical Research Foundation, Washington DC Vol. 5, Suppl. 3, pp. 345-358; Hein J. (1990) Unified Approach to Alignment and Phylogenesis pp. 626-645 *Methods in Enzymology* vol. 183, Academic Press, Inc., San Diego, CA; Higgins, D.G. and Sharp, P.M. (1989) *CABIOS* 5:151-153; Myers, E.W. and Muller W. (1988) *CABIOS* 4:11-17; Robinson, E.D. (1971) *Comb. Theor* 11:105; Santou, N. Nes, M. (1987) *Mol. Biol. Evol.* 4:406-425; Sneath, P.H.A. and Sokal, R.R. (1973) *Numerical Taxonomy – the Principles and Practice of Numerical Taxonomy*, Freeman Press, San Francisco, CA; Wilbur, W.J. and Lipman, D.J. (1983) *Proc. Natl. Acad., Sci. USA* 80:726-730.

Preferably, the "percentage of sequence identity" is determined by comparing two optimally aligned sequences over a window of comparison of at least 20 positions, wherein the portion of the polynucleotide or polypeptide sequence in the comparison window may comprise additions or deletions (i.e. gaps) of 20 percent or less, usually 5 to 15 percent, or 10 to 12 percent, as compared to the reference sequences (which does not comprise additions or deletions) for optimal alignment of the two

sequences. The percentage is calculated by determining the number of positions at which the identical nucleic acid bases or amino acid residue occurs in both sequences to yield the number of matched positions, dividing the number of matched positions by the total number of positions in the reference sequence (i.e. the window size) and multiplying the results by 100 to yield the percentage of sequence identity.

Variants may also, or alternatively, be substantially homologous to a native gene, or a portion or complement thereof. Such polynucleotide variants are capable of hybridizing under moderately stringent conditions to a naturally occurring DNA sequence encoding a native breast tumor protein (or a complementary sequence). Suitable moderately stringent conditions include prewashing in a solution of 5 X SSC, 0.5% SDS, 1.0 mM EDTA (pH 8.0); hybridizing at 50°C-65°C, 5 X SSC, overnight; followed by washing twice at 65°C for 20 minutes with each of 2X, 0.5X and 0.2X SSC containing 0.1% SDS.

It will be appreciated by those of ordinary skill in the art that, as a result of the degeneracy of the genetic code, there are many nucleotide sequences that encode a polypeptide as described herein. Some of these polynucleotides bear minimal homology to the nucleotide sequence of any native gene. Nonetheless, polynucleotides that vary due to differences in codon usage are specifically contemplated by the present invention. Further, alleles of the genes comprising the polynucleotide sequences provided herein are within the scope of the present invention. Alleles are endogenous genes that are altered as a result of one or more mutations, such as deletions, additions and/or substitutions of nucleotides. The resulting mRNA and protein may, but need not, have an altered structure or function. Alleles may be identified using standard techniques (such as hybridization, amplification and/or database sequence comparison).

Polynucleotides may be prepared using any of a variety of techniques. For example, a polynucleotide may be identified, as described in more detail below, by screening a microarray of cDNAs for tumor-associated expression (*i.e.*, expression that is at least five fold greater in a breast tumor than in normal tissue, as determined using a representative assay provided herein). Such screens may be performed using a Synteni microarray (Palo Alto, CA) according to the manufacturer's instructions (and essentially

as described by Schena et al., *Proc. Natl. Acad. Sci. USA* 93:10614-10619, 1996 and Heller et al., *Proc. Natl. Acad. Sci. USA* 94:2150-2155, 1997). Alternatively, polypeptides may be amplified from cDNA prepared from cells expressing the proteins described herein, such as breast tumor cells. Such polynucleotides may be amplified via polymerase chain reaction (PCR). For this approach, sequence-specific primers may be designed based on the sequences provided herein, and may be purchased or synthesized.

An amplified portion may be used to isolate a full length gene from a suitable library (*e.g.*, a breast tumor cDNA library) using well known techniques. Within such techniques, a library (cDNA or genomic) is screened using one or more polynucleotide probes or primers suitable for amplification. Preferably, a library is size-selected to include larger molecules. Random primed libraries may also be preferred for identifying 5' and upstream regions of genes. Genomic libraries are preferred for obtaining introns and extending 5' sequences.

For hybridization techniques, a partial sequence may be labeled (*e.g.*, by nick-translation or end-labeling with ^{32}P) using well known techniques. A bacterial or bacteriophage library is then screened by hybridizing filters containing denatured bacterial colonies (or lawns containing phage plaques) with the labeled probe (*see* Sambrook et al., *Molecular Cloning: A Laboratory Manual*, Cold Spring Harbor Laboratories, Cold Spring Harbor, NY, 1989). Hybridizing colonies or plaques are selected and expanded, and the DNA is isolated for further analysis. cDNA clones may be analyzed to determine the amount of additional sequence by, for example, PCR using a primer from the partial sequence and a primer from the vector. Restriction maps and partial sequences may be generated to identify one or more overlapping clones. The complete sequence may then be determined using standard techniques, which may involve generating a series of deletion clones. The resulting overlapping sequences are then assembled into a single contiguous sequence. A full length cDNA molecule can be generated by ligating suitable fragments, using well known techniques.

Alternatively, there are numerous amplification techniques for obtaining a full length coding sequence from a partial cDNA sequence. Within such techniques, amplification is generally performed via PCR. Any of a variety of commercially available kits may be used to perform the amplification step. Primers may be designed

using, for example, software well known in the art. Primers are preferably 22-30 nucleotides in length, have a GC content of at least 50% and anneal to the target sequence at temperatures of about 68°C to 72°C. The amplified region may be sequenced as described above, and overlapping sequences assembled into a contiguous sequence.

One such amplification technique is inverse PCR (*see* Triglia et al., *Nucl. Acids Res.* 16:8186, 1988), which uses restriction enzymes to generate a fragment in the known region of the gene. The fragment is then circularized by intramolecular ligation and used as a template for PCR with divergent primers derived from the known region. Within an alternative approach, sequences adjacent to a partial sequence may be retrieved by amplification with a primer to a linker sequence and a primer specific to a known region. The amplified sequences are typically subjected to a second round of amplification with the same linker primer and a second primer specific to the known region. A variation on this procedure, which employs two primers that initiate extension in opposite directions from the known sequence, is described in WO 96/38591. Another such technique is known as "rapid amplification of cDNA ends" or RACE. This technique involves the use of an internal primer and an external primer, which hybridizes to a polyA region or vector sequence, to identify sequences that are 5' and 3' of a known sequence. Additional techniques include capture PCR (Lagerstrom et al., *PCR Methods Applic.* 1:111-19, 1991) and walking PCR (Parker et al., *Nucl. Acids. Res.* 19:3055-60, 1991). Other methods employing amplification may also be employed to obtain a full length cDNA sequence.

In certain instances, it is possible to obtain a full length cDNA sequence by analysis of sequences provided in an expressed sequence tag (EST) database, such as that available from GenBank. Searches for overlapping ESTs may generally be performed using well known programs (*e.g.*, NCBI BLAST searches), and such ESTs may be used to generate a contiguous full length sequence. Full length DNA sequences may also be obtained by analysis of genomic fragments.

Certain nucleic acid sequences of cDNA molecules encoding portions of breast tumor proteins are provided in SEQ ID NO: 1-175, 178, 180 and 182-468. The

isolation of these sequences is described in detail below.

Polynucleotide variants may generally be prepared by any method known in the art, including chemical synthesis by, for example, solid phase phosphoramidite chemical synthesis. Modifications in a polynucleotide sequence may also be introduced using standard mutagenesis techniques, such as oligonucleotide-directed site-specific mutagenesis (*see* Adelman et al., *DNA* 2:183, 1983). Alternatively, RNA molecules may be generated by *in vitro* or *in vivo* transcription of DNA sequences encoding a breast tumor protein, or portion thereof, provided that the DNA is incorporated into a vector with a suitable RNA polymerase promoter (such as T7 or SP6). Certain portions may be used to prepare an encoded polypeptide, as described herein. In addition, or alternatively, a portion may be administered to a patient such that the encoded polypeptide is generated *in vivo* (*e.g.*, by transfecting antigen-presenting cells, such as dendritic cells, with a cDNA construct encoding a breast tumor polypeptide, and administering the transfected cells to the patient).

A portion of a sequence complementary to a coding sequence (*i.e.*, an antisense polynucleotide) may also be used as a probe or to modulate gene expression. cDNA constructs that can be transcribed into antisense RNA may also be introduced into cells of tissues to facilitate the production of antisense RNA. An antisense polynucleotide may be used, as described herein, to inhibit expression of a tumor protein. Antisense technology can be used to control gene expression through triple-helix formation, which compromises the ability of the double helix to open sufficiently for the binding of polymerases, transcription factors or regulatory molecules (*see* Gee et al., *In Huber and Carr, Molecular and Immunologic Approaches*, Futura Publishing Co. (Mt. Kisco, NY; 1994)). Alternatively, an antisense molecule may be designed to hybridize with a control region of a gene (*e.g.*, promoter, enhancer or transcription initiation site), and block transcription of the gene; or to block translation by inhibiting binding of a transcript to ribosomes.

A portion of a coding sequence, or of a complementary sequence, may also be designed as a probe or primer to detect gene expression. Probes may be labeled with a variety of reporter groups, such as radionuclides and enzymes, and are preferably at least 10 nucleotides in length, more preferably at least 20 nucleotides in length and

still more preferably at least 30 nucleotides in length. Primers, as noted above, are preferably 22-30 nucleotides in length.

Any polynucleotide may be further modified to increase stability *in vivo*. Possible modifications include, but are not limited to, the addition of flanking sequences at the 5' and/or 3' ends; the use of phosphorothioate or 2' O-methyl rather than phosphodiesterase linkages in the backbone; and/or the inclusion of nontraditional bases such as inosine, queosine and wybutosine, as well as acetyl-, methyl-, thio- and other modified forms of adenine, cytidine, guanine, thymine and uridine.

Nucleotide sequences as described herein may be joined to a variety of other nucleotide sequences using established recombinant DNA techniques. For example, a polynucleotide may be cloned into any of a variety of cloning vectors, including plasmids, phagemids, lambda phage derivatives and cosmids. Vectors of particular interest include expression vectors, replication vectors, probe generation vectors and sequencing vectors. In general, a vector will contain an origin of replication functional in at least one organism, convenient restriction endonuclease sites and one or more selectable markers. Other elements will depend upon the desired use, and will be apparent to those of ordinary skill in the art.

Within certain embodiments, polynucleotides may be formulated so as to permit entry into a cell of a mammal, and expression therein. Such formulations are particularly useful for therapeutic purposes, as described below. Those of ordinary skill in the art will appreciate that there are many ways to achieve expression of a polynucleotide in a target cell, and any suitable method may be employed. For example, a polynucleotide may be incorporated into a viral vector such as, but not limited to, adenovirus, adeno-associated virus, retrovirus, or vaccinia or other pox virus (*e.g.*, avian pox virus). The polynucleotides may also be administered as naked plasmid vectors. Techniques for incorporating DNA into such vectors are well known to those of ordinary skill in the art. A retroviral vector may additionally transfer or incorporate a gene for a selectable marker (to aid in the identification or selection of transduced cells) and/or a targeting moiety, such as a gene that encodes a ligand for a receptor on a specific target cell, to render the vector target specific. Targeting may also be accomplished using an antibody, by methods known to those of ordinary skill in the art.

Other formulations for therapeutic purposes include colloidal dispersion systems, such as macromolecule complexes, nanocapsules, microspheres, beads, and lipid-based systems including oil-in-water emulsions, micelles, mixed micelles, and liposomes. A preferred colloidal system for use as a delivery vehicle *in vitro* and *in vivo* is a liposome (*i.e.*, an artificial membrane vesicle). The preparation and use of such systems is well known in the art.

BREAST TUMOR POLYPEPTIDES

Within the context of the present invention, polypeptides may comprise at least an immunogenic portion of a breast tumor protein or a variant thereof, as described herein. As noted above, a "breast tumor protein" is a protein that is expressed by breast tumor cells. Proteins that are breast tumor proteins also react detectably within an immunoassay (such as an ELISA) with antisera from a patient with breast cancer. Polypeptides as described herein may be of any length. Additional sequences derived from the native protein and/or heterologous sequences may be present, and such sequences may (but need not) possess further immunogenic or antigenic properties.

An "immunogenic portion," as used herein is a portion of a protein that is

recognized (*i.e.*, specifically bound) by a B-cell and/or T-cell surface antigen receptor. Such immunogenic portions generally comprise at least 5 amino acid residues, more preferably at least 10, and still more preferably at least 20 amino acid residues of a breast tumor protein or a variant thereof. Certain preferred immunogenic portions include peptides in which an N-terminal leader sequence and/or transmembrane domain have been deleted. Other preferred immunogenic portions may contain a small N- and/or C-terminal deletion (*e.g.*, 1-30 amino acids, preferably 5-15 amino acids), relative to the mature protein.

Immunogenic portions may generally be identified using well known techniques, such as those summarized in Paul, *Fundamental Immunology*, 3rd ed., 243-247 (Raven Press, 1993) and references cited therein. Such techniques include screening polypeptides for the ability to react with antigen-specific antibodies, antisera and/or T-cell lines or clones. As used herein, antisera and antibodies are "antigen-specific" if they specifically bind to an antigen (*i.e.*, they react with the protein in an ELISA or other immunoassay, and do not react detectably with unrelated proteins). Such antisera and antibodies may be prepared as described herein, and using well known techniques. An immunogenic portion of a native breast tumor protein is a portion that reacts with such antisera and/or T-cells at a level that is not substantially less than the reactivity of the full length polypeptide (*e.g.*, in an ELISA and/or T-cell reactivity assay). Such immunogenic portions may react within such assays at a level that is similar to or greater than the reactivity of the full length polypeptide. Such screens may generally be performed using methods well known to those of ordinary skill in the art, such as those described in Harlow and Lane, *Antibodies: A Laboratory Manual*, Cold Spring Harbor Laboratory, 1988. For example, a polypeptide may be immobilized on a solid support and contacted with patient sera to allow binding of antibodies within the sera to the immobilized polypeptide. Unbound sera may then be removed and bound antibodies detected using, for example, ¹²⁵I-labeled Protein A.

As noted above, a composition may comprise a variant of a native breast tumor protein. A polypeptide "variant," as used herein, is a polypeptide that differs from a native breast tumor protein in one or more substitutions, deletions, additions and/or insertions, such that the immunogenicity of the polypeptide is not substantially

diminished. In other words, the ability of a variant to react with antigen-specific antisera may be enhanced or unchanged, relative to the native protein, or may be diminished by less than 50%, and preferably less than 20%, relative to the native protein. Such variants may generally be identified by modifying one of the above polypeptide sequences and evaluating the reactivity of the modified polypeptide with antigen-specific antibodies or antisera as described herein. Preferred variants include those in which one or more portions, such as an N-terminal leader sequence or transmembrane domain, have been removed. Other preferred variants include variants in which a small portion (*e.g.*, 1-30 amino acids, preferably 5-15 amino acids) has been removed from the N- and/or C-terminal of the mature protein.

Polypeptide variants preferably exhibit at least about 70%, more preferably at least about 90% and most preferably at least about 95% identity (determined as described above) to the identified polypeptides.

Preferably, a variant contains conservative substitutions. A "conservative substitution" is one in which an amino acid is substituted for another amino acid that has similar properties, such that one skilled in the art of peptide chemistry would expect the secondary structure and hydropathic nature of the polypeptide to be substantially unchanged. Amino acid substitutions may generally be made on the basis of similarity in polarity, charge, solubility, hydrophobicity, hydrophilicity and/or the amphipathic nature of the residues. For example, negatively charged amino acids include aspartic acid and glutamic acid; positively charged amino acids include lysine and arginine; and amino acids with uncharged polar head groups having similar hydrophilicity values include leucine, isoleucine and valine; glycine and alanine; asparagine and glutamine; and serine, threonine, phenylalanine and tyrosine. Other groups of amino acids that may represent conservative changes include: (1) ala, pro, gly, glu, asp, gln, asn, ser, thr; (2) cys, ser, tyr, thr; (3) val, ile, leu, met, ala, phe; (4) lys, arg, his; and (5) phe, tyr, trp, his. A variant may also, or alternatively, contain nonconservative changes. In a preferred embodiment, variant polypeptides differ from a native sequence by substitution, deletion or addition of five amino acids or fewer. Variants may also (or alternatively) be modified by, for example, the deletion or addition of amino acids that have minimal influence on the immunogenicity, secondary structure and hydropathic nature of the polypeptide.

As noted above, polypeptides may comprise a signal (or leader) sequence at the N-terminal end of the protein which co-translationally or post-translationally directs transfer of the protein. The polypeptide may also be conjugated to a linker or other sequence for ease of synthesis, purification or identification of the polypeptide (e.g., poly-His), or to enhance binding of the polypeptide to a solid support. For example, a polypeptide may be conjugated to an immunoglobulin Fc region.

Polypeptides may be prepared using any of a variety of well known techniques. Recombinant polypeptides encoded by DNA sequences as described above may be readily prepared from the DNA sequences using any of a variety of expression vectors known to those of ordinary skill in the art. Expression may be achieved in any appropriate host cell that has been transformed or transfected with an expression vector containing a DNA molecule that encodes a recombinant polypeptide. Suitable host cells include prokaryotes, yeast, higher eukaryotic and plant cells. Preferably, the host cells employed are *E. coli*, yeast or a mammalian cell line such as COS or CHO. Supernatants from suitable host/vector systems which secrete recombinant protein or polypeptide into culture media may be first concentrated using a commercially available filter. Following concentration, the concentrate may be applied to a suitable purification matrix such as an affinity matrix or an ion exchange resin. Finally, one or more reverse phase HPLC steps can be employed to further purify a recombinant polypeptide.

Portions and other variants having fewer than about 100 amino acids, and generally fewer than about 50 amino acids, may also be generated by synthetic means, using techniques well known to those of ordinary skill in the art. For example, such polypeptides may be synthesized using any of the commercially available solid-phase techniques, such as the Merrifield solid-phase synthesis method, where amino acids are sequentially added to a growing amino acid chain. See Merrifield, *J. Am. Chem. Soc.* 85:2149-2146, 1963. Equipment for automated synthesis of polypeptides is commercially available from suppliers such as Perkin Elmer/Applied BioSystems Division (Foster City, CA), and may be operated according to the manufacturer's instructions.

Within certain specific embodiments, a polypeptide may be a fusion protein that comprises multiple polypeptides as described herein, or that comprises at

least one polypeptide as described herein and an unrelated sequence, such as a known tumor protein. A fusion partner may, for example, assist in providing T helper epitopes (an immunological fusion partner), preferably T helper epitopes recognized by humans, or may assist in expressing the protein (an expression enhancer) at higher yields than the native recombinant protein. Certain preferred fusion partners are both immunological and expression enhancing fusion partners. Other fusion partners may be selected so as to increase the solubility of the protein or to enable the protein to be targeted to desired intracellular compartments. Still further fusion partners include affinity tags, which facilitate purification of the protein.

Fusion proteins may generally be prepared using standard techniques, including chemical conjugation. Preferably, a fusion protein is expressed as a recombinant protein, allowing the production of increased levels, relative to a non-fused protein, in an expression system. Briefly, DNA sequences encoding the polypeptide components may be assembled separately, and ligated into an appropriate expression vector. The 3' end of the DNA sequence encoding one polypeptide component is ligated, with or without a peptide linker, to the 5' end of a DNA sequence encoding the second polypeptide component so that the reading frames of the sequences are in phase. This permits translation into a single fusion protein that retains the biological activity of both component polypeptides.

A peptide linker sequence may be employed to separate the first and the second polypeptide components by a distance sufficient to ensure that each polypeptide folds into its secondary and tertiary structures. Such a peptide linker sequence is incorporated into the fusion protein using standard techniques well known in the art. Suitable peptide linker sequences may be chosen based on the following factors: (1) their ability to adopt a flexible extended conformation; (2) their inability to adopt a secondary structure that could interact with functional epitopes on the first and second polypeptides; and (3) the lack of hydrophobic or charged residues that might react with the polypeptide functional epitopes. Preferred peptide linker sequences contain Gly, Asn and Ser residues. Other near neutral amino acids, such as Thr and Ala may also be used in the linker sequence. Amino acid sequences which may be usefully employed as linkers include those disclosed in Maratea et al., *Gene* 40:39-46, 1985; Murphy et al.,

Proc. Natl. Acad. Sci. USA 83:8258-8262, 1986; U.S. Patent No. 4,935,233 and U.S. Patent No. 4,751,180. The linker sequence may generally be from 1 to about 50 amino acids in length. Linker sequences are not required when the first and second polypeptides have non-essential N-terminal amino acid regions that can be used to separate the functional domains and prevent steric interference.

The ligated DNA sequences are operably linked to suitable transcriptional or translational regulatory elements. The regulatory elements responsible for expression of DNA are located only 5' to the DNA sequence encoding the first polypeptides. Similarly, stop codons required to end translation and transcription termination signals are only present 3' to the DNA sequence encoding the second polypeptide.

Fusion proteins are also provided that comprise a polypeptide of the present invention together with an unrelated immunogenic protein. Preferably the immunogenic protein is capable of eliciting a recall response. Examples of such proteins include tetanus, tuberculosis and hepatitis proteins (*see, for example, Stoute et al. New Engl. J. Med.*, 336:86-91, 1997).

Within preferred embodiments, an immunological fusion partner is derived from protein D, a surface protein of the gram-negative bacterium *Haemophilus influenza B* (WO 91/18926). Preferably, a protein D derivative comprises approximately the first third of the protein (*e.g.*, the first N-terminal 100-110 amino acids), and a protein D derivative may be lipidated. Within certain preferred embodiments, the first 109 residues of a Lipoprotein D fusion partner is included on the N-terminus to provide the polypeptide with additional exogenous T-cell epitopes and to increase the expression level in *E. coli* (thus functioning as an expression enhancer). The lipid tail ensures optimal presentation of the antigen to antigen presenting cells. Other fusion partners include the non-structural protein from influenzae virus, NS1 (hemagglutinin). Typically, the N-terminal 81 amino acids are used, although different fragments that include T-helper epitopes may be used.

In another embodiment, the immunological fusion partner is the protein known as LYTA, or a portion thereof (preferably a C-terminal portion). LYTA is derived from *Streptococcus pneumoniae*, which synthesizes an N-acetyl-L-alanine amidase known as amidase LYTA (encoded by the *LytA* gene; *Gene* 43:265-292, 1986).

LYTA is an autolysin that specifically degrades certain bonds in the peptidoglycan backbone. The C-terminal domain of the LYTA protein is responsible for the affinity to the choline or to some choline analogues such as DEAE. This property has been exploited for the development of *E. coli* C-LYTA expressing plasmids useful for expression of fusion proteins. Purification of hybrid proteins containing the C-LYTA fragment at the amino terminus has been described (*see Biotechnology 10:795-798, 1992*). Within a preferred embodiment, a repeat portion of LYTA may be incorporated into a fusion protein. A repeat portion is found in the C-terminal region starting at residue 178. A particularly preferred repeat portion incorporates residues 188-305.

In general, polypeptides (including fusion proteins) and polynucleotides as described herein are isolated. An "isolated" polypeptide or polynucleotide is one that is removed from its original environment. For example, a naturally-occurring protein is isolated if it is separated from some or all of the coexisting materials in the natural system. Preferably, such polypeptides are at least about 90% pure, more preferably at least about 95% pure and most preferably at least about 99% pure. A polynucleotide is considered to be isolated if, for example, it is cloned into a vector that is not a part of the natural environment.

BINDING AGENTS

The present invention further provides agents, such as antibodies and antigen-binding fragments thereof, that specifically bind to a breast tumor protein. As used herein, an antibody, or antigen-binding fragment thereof, is said to "specifically bind" to a breast tumor protein if it reacts at a detectable level (within, for example, an ELISA) with a breast tumor protein, and does not react detectably with unrelated proteins under similar conditions. As used herein, "binding" refers to a noncovalent association between two separate molecules such that a complex is formed. The ability to bind may be evaluated by, for example, determining a binding constant for the formation of the complex. The binding constant is the value obtained when the concentration of the complex is divided by the product of the component concentrations. In general, two compounds are said to "bind," in the context of the present invention, when the binding constant for complex formation exceeds about 10^3 L/mol. The binding constant may be

determined using methods well known in the art.

Binding agents may be further capable of differentiating between patients with and without a cancer, such as breast cancer, using the representative assays provided herein. In other words, antibodies or other binding agents that bind to a breast tumor protein will generate a signal indicating the presence of a cancer in at least about 20% of patients with the disease, and will generate a negative signal indicating the absence of the disease in at least about 90% of individuals without the cancer. To determine whether a binding agent satisfies this requirement, biological samples (*e.g.*, blood, sera, urine and/or tumor biopsies) from patients with and without a cancer (as determined using standard clinical tests) may be assayed as described herein for the presence of polypeptides that bind to the binding agent. It will be apparent that a statistically significant number of samples with and without the disease should be assayed. Each binding agent should satisfy the above criteria; however, those of ordinary skill in the art will recognize that binding agents may be used in combination to improve sensitivity.

Any agent that satisfies the above requirements may be a binding agent. For example, a binding agent may be a ribosome, with or without a peptide component, an RNA molecule or a polypeptide. In a preferred embodiment, a binding agent is an antibody or an antigen-binding fragment thereof. Antibodies may be prepared by any of a variety of techniques known to those of ordinary skill in the art. *See, e.g.*, Harlow and Lane, *Antibodies: A Laboratory Manual*, Cold Spring Harbor Laboratory, 1988. In general, antibodies can be produced by cell culture techniques, including the generation of monoclonal antibodies as described herein, or via transfection of antibody genes into suitable bacterial or mammalian cell hosts, in order to allow for the production of recombinant antibodies. In one technique, an immunogen comprising the polypeptide is initially injected into any of a wide variety of mammals (*e.g.*, mice, rats, rabbits, sheep or goats). In this step, the polypeptides of this invention may serve as the immunogen without modification. Alternatively, particularly for relatively short polypeptides, a superior immune response may be elicited if the polypeptide is joined to a carrier protein, such as bovine serum albumin or keyhole limpet hemocyanin. The immunogen is injected into the animal host, preferably according to a predetermined schedule incorporating one or more booster immunizations, and the animals are bled periodically.

Polyclonal antibodies specific for the polypeptide may then be purified from such antisera by, for example, affinity chromatography using the polypeptide coupled to a suitable solid support.

Monoclonal antibodies specific for an antigenic polypeptide of interest may be prepared, for example, using the technique of Kohler and Milstein, *Eur. J. Immunol.* 6:511-519, 1976, and improvements thereto. Briefly, these methods involve the preparation of immortal cell lines capable of producing antibodies having the desired specificity (*i.e.*, reactivity with the polypeptide of interest). Such cell lines may be produced, for example, from spleen cells obtained from an animal immunized as described above. The spleen cells are then immortalized by, for example, fusion with a myeloma cell fusion partner, preferably one that is syngeneic with the immunized animal. A variety of fusion techniques may be employed. For example, the spleen cells and myeloma cells may be combined with a nonionic detergent for a few minutes and then plated at low density on a selective medium that supports the growth of hybrid cells, but not myeloma cells. A preferred selection technique uses HAT (hypoxanthine, aminopterin, thymidine) selection. After a sufficient time, usually about 1 to 2 weeks, colonies of hybrids are observed. Single colonies are selected and their culture supernatants tested for binding activity against the polypeptide. Hybridomas having high reactivity and specificity are preferred.

Monoclonal antibodies may be isolated from the supernatants of growing hybridoma colonies. In addition, various techniques may be employed to enhance the yield, such as injection of the hybridoma cell line into the peritoneal cavity of a suitable vertebrate host, such as a mouse. Monoclonal antibodies may then be harvested from the ascites fluid or the blood. Contaminants may be removed from the antibodies by conventional techniques, such as chromatography, gel filtration, precipitation, and extraction. The polypeptides of this invention may be used in the purification process in, for example, an affinity chromatography step.

Within certain embodiments, the use of antigen-binding fragments of antibodies may be preferred. Such fragments include Fab fragments, which may be prepared using standard techniques. Briefly, immunoglobulins may be purified from rabbit serum by affinity chromatography on Protein A bead columns (Harlow and Lane,

Antibodies: A Laboratory Manual, Cold Spring Harbor Laboratory, 1988) and digested by papain to yield Fab and Fc fragments. The Fab and Fc fragments may be separated by affinity chromatography on protein A bead columns.

Monoclonal antibodies of the present invention may be coupled to one or more therapeutic agents. Suitable agents in this regard include radionuclides, differentiation inducers, drugs, toxins, and derivatives thereof. Preferred radionuclides include ^{90}Y , ^{123}I , ^{125}I , ^{131}I , ^{186}Re , ^{188}Re , ^{211}At , and ^{212}Bi . Preferred drugs include methotrexate, and pyrimidine and purine analogs. Preferred differentiation inducers include phorbol esters and butyric acid. Preferred toxins include ricin, abrin, diphtheria toxin, cholera toxin, gelonin, *Pseudomonas* exotoxin, *Shigella* toxin, and pokeweed antiviral protein.

A therapeutic agent may be coupled (*e.g.*, covalently bonded) to a suitable monoclonal antibody either directly or indirectly (*e.g.*, via a linker group). A direct reaction between an agent and an antibody is possible when each possesses a substituent capable of reacting with the other. For example, a nucleophilic group, such as an amino or sulfhydryl group, on one may be capable of reacting with a carbonyl-containing group, such as an anhydride or an acid halide, or with an alkyl group containing a good leaving group (*e.g.*, a halide) on the other.

Alternatively, it may be desirable to couple a therapeutic agent and an antibody via a linker group. A linker group can function as a spacer to distance an antibody from an agent in order to avoid interference with binding capabilities. A linker group can also serve to increase the chemical reactivity of a substituent on an agent or an antibody, and thus increase the coupling efficiency. An increase in chemical reactivity may also facilitate the use of agents, or functional groups on agents, which otherwise would not be possible.

It will be evident to those skilled in the art that a variety of bifunctional or polyfunctional reagents, both homo- and hetero-functional (such as those described in the catalog of the Pierce Chemical Co., Rockford, IL), may be employed as the linker group. Coupling may be effected, for example, through amino groups, carboxyl groups, sulfhydryl groups or oxidized carbohydrate residues. There are numerous references describing such methodology, *e.g.*, U.S. Patent No. 4,671,958, to Rodwell et al.

Where a therapeutic agent is more potent when free from the antibody portion of the immunoconjugates of the present invention, it may be desirable to use a linker group which is cleavable during or upon internalization into a cell. A number of different cleavable linker groups have been described. The mechanisms for the intracellular release of an agent from these linker groups include cleavage by reduction of a disulfide bond (*e.g.*, U.S. Patent No. 4,489,710, to Spitler), by irradiation of a photolabile bond (*e.g.*, U.S. Patent No. 4,625,014, to Senter et al.), by hydrolysis of derivatized amino acid side chains (*e.g.*, U.S. Patent No. 4,638,045, to Kohn et al.), by serum complement-mediated hydrolysis (*e.g.*, U.S. Patent No. 4,671,958, to Rodwell et al.), and acid-catalyzed hydrolysis (*e.g.*, U.S. Patent No. 4,569,789, to Blattler et al.).

It may be desirable to couple more than one agent to an antibody. In one embodiment, multiple molecules of an agent are coupled to one antibody molecule. In another embodiment, more than one type of agent may be coupled to one antibody. Regardless of the particular embodiment, immunoconjugates with more than one agent may be prepared in a variety of ways. For example, more than one agent may be coupled directly to an antibody molecule, or linkers which provide multiple sites for attachment can be used. Alternatively, a carrier can be used.

A carrier may bear the agents in a variety of ways, including covalent bonding either directly or via a linker group. Suitable carriers include proteins such as albumins (*e.g.*, U.S. Patent No. 4,507,234, to Kato et al.), peptides and polysaccharides such as aminodextran (*e.g.*, U.S. Patent No. 4,699,784, to Shih et al.). A carrier may also bear an agent by noncovalent bonding or by encapsulation, such as within a liposome vesicle (*e.g.*, U.S. Patent Nos. 4,429,008 and 4,873,088). Carriers specific for radionuclide agents include radiohalogenated small molecules and chelating compounds. For example, U.S. Patent No. 4,735,792 discloses representative radiohalogenated small molecules and their synthesis. A radionuclide chelate may be formed from chelating compounds that include those containing nitrogen and sulfur atoms as the donor atoms for binding the metal, or metal oxide, radionuclide. For example, U.S. Patent No. 4,673,562, to Davison et al. discloses representative chelating compounds and their synthesis.

A variety of routes of administration for the antibodies and

immunoconjugates may be used. Typically, administration will be intravenous, intramuscular, subcutaneous or in the bed of a resected tumor. It will be evident that the precise dose of the antibody/immunoconjugate will vary depending upon the antibody used, the antigen density on the tumor, and the rate of clearance of the antibody.

T CELLS

Immunotherapeutic compositions may also, or alternatively, comprise T cells specific for a breast tumor protein. Such cells may generally be prepared *in vitro* or *ex vivo*, using standard procedures. For example, T cells may be isolated from bone marrow, peripheral blood, or a fraction of bone marrow or peripheral blood of a patient, using a commercially available cell separation system, such as the ISOLEX™ system, available from Nexell Therapeutics Inc., Irvine, CA (see also U.S. Patent No. 5,240,856; U.S. Patent No. 5,215,926; WO 89/06280; WO 91/16116 and WO 92/07243). Alternatively, T cells may be derived from related or unrelated humans, non-human mammals, cell lines or cultures.

T cells may be stimulated with a breast tumor polypeptide, polynucleotide encoding a breast tumor polypeptide and/or an antigen presenting cell (APC) that expresses such a polypeptide. Such stimulation is performed under conditions and for a time sufficient to permit the generation of T cells that are specific for the polypeptide. Preferably, a breast tumor polypeptide or polynucleotide is present within a delivery vehicle, such as a microsphere, to facilitate the generation of specific T cells.

T cells are considered to be specific for a breast tumor polypeptide if the T cells kill target cells coated with the polypeptide or expressing a gene encoding the polypeptide. T cell specificity may be evaluated using any of a variety of standard techniques. For example, within a chromium release assay or proliferation assay, a stimulation index of more than two fold increase in lysis and/or proliferation, compared to negative controls, indicates T cell specificity. Such assays may be performed, for example, as described in Chen et al., *Cancer Res.* 54:1065-1070, 1994. Alternatively, detection of the proliferation of T cells may be accomplished by a variety of known techniques. For example, T cell proliferation can be detected by measuring an increased

rate of DNA synthesis (*e.g.*, by pulse-labeling cultures of T cells with tritiated thymidine and measuring the amount of tritiated thymidine incorporated into DNA). Contact with a breast tumor polypeptide (100 ng/ml - 100 µg/ml, preferably 200 ng/ml - 25 µg/ml) for 3 - 7 days should result in at least a two fold increase in proliferation of the T cells. Contact as described above for 2-3 hours should result in activation of the T cells, as measured using standard cytokine assays in which a two fold increase in the level of cytokine release (*e.g.*, TNF or IFN-γ) is indicative of T cell activation (*see* Coligan et al., Current Protocols in Immunology, vol. 1, Wiley Interscience (Greene 1998)). T cells that have been activated in response to a breast tumor polypeptide, polynucleotide or polypeptide-expressing APC may be CD4⁺ and/or CD8⁺. Breast tumor protein-specific T cells may be expanded using standard techniques. Within preferred embodiments, the T cells are derived from either a patient or a related, or unrelated, donor and are administered to the patient following stimulation and expansion.

For therapeutic purposes, CD4⁺ or CD8⁺ T cells that proliferate in response to a breast tumor polypeptide, polynucleotide or APC can be expanded in number either *in vitro* or *in vivo*. Proliferation of such T cells *in vitro* may be accomplished in a variety of ways. For example, the T cells can be re-exposed to a breast tumor polypeptide, or a short peptide corresponding to an immunogenic portion of such a polypeptide, with or without the addition of T cell growth factors, such as interleukin-2, and/or stimulator cells that synthesize a breast tumor polypeptide. Alternatively, one or more T cells that proliferate in the presence of a breast tumor protein can be expanded in number by cloning. Methods for cloning cells are well known in the art, and include limiting dilution.

PHARMACEUTICAL COMPOSITIONS AND VACCINES

Within certain aspects, polypeptides, polynucleotides, T cells and/or binding agents disclosed herein may be incorporated into pharmaceutical compositions or immunogenic compositions (*i.e.*, vaccines). Pharmaceutical compositions comprise one or more such compounds and a physiologically acceptable carrier. Vaccines may comprise one or more such compounds and an immunostimulant. An immunostimulant

may be any substance that enhances an immune response to an exogenous antigen. Examples of immunostimulants include adjuvants, biodegradable microspheres (e.g., polylactic galactide) and liposomes (into which the compound is incorporated; see e.g., Fullerton, U.S. Patent No. 4,235,877). Vaccine preparation is generally described in, for example, M.F. Powell and M.J. Newman, eds., "Vaccine Design (the subunit and adjuvant approach)," Plenum Press (NY, 1995). Pharmaceutical compositions and vaccines within the scope of the present invention may also contain other compounds, which may be biologically active or inactive. For example, one or more immunogenic portions of other tumor antigens may be present, either incorporated into a fusion polypeptide or as a separate compound, within the composition or vaccine.

A pharmaceutical composition or vaccine may contain DNA encoding one or more of the polypeptides as described above, such that the polypeptide is generated *in situ*. As noted above, the DNA may be present within any of a variety of delivery systems known to those of ordinary skill in the art, including nucleic acid expression systems, bacteria and viral expression systems. Numerous gene delivery techniques are well known in the art, such as those described by Rolland, *Crit. Rev. Therap. Drug Carrier Systems* 15:143-198, 1998, and references cited therein. Appropriate nucleic acid expression systems contain the necessary DNA sequences for expression in the patient (such as a suitable promoter and terminating signal). Bacterial delivery systems involve the administration of a bacterium (such as *Bacillus-Calmette-Guerrin*) that expresses an immunogenic portion of the polypeptide on its cell surface or secretes such an epitope. In a preferred embodiment, the DNA may be introduced using a viral expression system (e.g., vaccinia or other pox virus, retrovirus, or adenovirus), which may involve the use of a non-pathogenic (defective), replication competent virus. Suitable systems are disclosed, for example, in Fisher-Hoch et al., *Proc. Natl. Acad. Sci. USA* 86:317-321, 1989; Flexner et al., *Ann. N.Y. Acad. Sci.* 569:86-103, 1989; Flexner et al., *Vaccine* 8:17-21, 1990; U.S. Patent Nos. 4,603,112, 4,769,330, and 5,017,487; WO 89/01973; U.S. Patent No. 4,777,127; GB 2,200,651; EP 0,345,242; WO 91/02805; Berkner, *Biotechniques* 6:616-627, 1988; Rosenfeld et al., *Science* 252:431-434, 1991; Kolls et al., *Proc. Natl. Acad. Sci. USA* 91:215-219, 1994; Kass-Eisler et al., *Proc. Natl. Acad. Sci. USA* 90:11498-11502, 1993; Guzman et al., *Circulation* 88:2838-2848, 1993;

and Guzman et al., *Cir. Res.* 73:1202-1207, 1993. Techniques for incorporating DNA into such expression systems are well known to those of ordinary skill in the art. The DNA may also be "naked," as described, for example, in Ulmer et al., *Science* 259:1745-1749, 1993 and reviewed by Cohen, *Science* 259:1691-1692, 1993. The uptake of naked DNA may be increased by coating the DNA onto biodegradable beads, which are efficiently transported into the cells.

While any suitable carrier known to those of ordinary skill in the art may be employed in the pharmaceutical compositions of this invention, the type of carrier will vary depending on the mode of administration. Compositions of the present invention may be formulated for any appropriate manner of administration, including for example, topical, oral, nasal, intravenous, intracranial, intraperitoneal, subcutaneous or intramuscular administration. For parenteral administration, such as subcutaneous injection, the carrier preferably comprises water, saline, alcohol, a fat, a wax or a buffer. For oral administration, any of the above carriers or a solid carrier, such as mannitol, lactose, starch, magnesium stearate, sodium saccharine, talcum, cellulose, glucose, sucrose, and magnesium carbonate, may be employed. Biodegradable microspheres (e.g., polylactate polyglycolate) may also be employed as carriers for the pharmaceutical compositions of this invention. Suitable biodegradable microspheres are disclosed, for example, in U.S. Patent Nos. 4,897,268 and 5,075,109.

Such compositions may also comprise buffers (e.g., neutral buffered saline or phosphate buffered saline), carbohydrates (e.g., glucose, mannose, sucrose or dextrans), mannitol, proteins, polypeptides or amino acids such as glycine, antioxidants, chelating agents such as EDTA or glutathione, adjuvants (e.g., aluminum hydroxide) and/or preservatives. Alternatively, compositions of the present invention may be formulated as a lyophilizate. Compounds may also be encapsulated within liposomes using well known technology.

Any of a variety of immunostimulants may be employed in the vaccines of this invention. For example, an adjuvant may be included. Most adjuvants contain a substance designed to protect the antigen from rapid catabolism, such as aluminum hydroxide or mineral oil, and a stimulator of immune responses, such as lipid A, *Bordetella pertussis* or *Mycobacterium tuberculosis* derived proteins. Suitable adjuvants

are commercially available as, for example, Freund's Incomplete Adjuvant and Complete Adjuvant (Difco Laboratories, Detroit, MI); Merck Adjuvant 65 (Merck and Company, Inc., Rahway, NJ); aluminum salts such as aluminum hydroxide gel (alum) or aluminum phosphate; salts of calcium, iron or zinc; an insoluble suspension of acylated tyrosine; acylated sugars; cationically or anionically derivatized polysaccharides; polyphosphazenes; biodegradable microspheres; monophosphoryl lipid A and quil A. Cytokines, such as GM-CSF or interleukin-2, -7, or -12, may also be used as adjuvants.

Within the vaccines provided herein, the adjuvant composition is preferably designed to induce an immune response predominantly of the Th1 type. High levels of Th1-type cytokines (*e.g.*, IFN- γ , TNF- α , IL-2 and IL-12) tend to favor the induction of cell mediated immune responses to an administered antigen. In contrast, high levels of Th2-type cytokines (*e.g.*, IL-4, IL-5, IL-6 and IL-10) tend to favor the induction of humoral immune responses. Following application of a vaccine as provided herein, a patient will support an immune response that includes Th1- and Th2-type responses. Within a preferred embodiment, in which a response is predominantly Th1-type, the level of Th1-type cytokines will increase to a greater extent than the level of Th2-type cytokines. The levels of these cytokines may be readily assessed using standard assays. For a review of the families of cytokines, see Mosmann and Coffman, *Ann. Rev. Immunol.* 7:145-173, 1989.

Preferred adjuvants for use in eliciting a predominantly Th1-type response include, for example, a combination of monophosphoryl lipid A, preferably 3-de-O-acylated monophosphoryl lipid A (3D-MPL), together with an aluminum salt. MPL adjuvants are available from Ribi ImmunoChem Research Inc. (Hamilton, MT) (*see* US Patent Nos. 4,436,727; 4,877,611; 4,866,034 and 4,912,094). CpG-containing oligonucleotides (in which the CpG dinucleotide is unmethylated) also induce a predominantly Th1 response. Such oligonucleotides are well known and are described, for example, in WO 96/02555. Another preferred adjuvant is a saponin, preferably QS21, which may be used alone or in combination with other adjuvants. For example, an enhanced system involves the combination of a monophosphoryl lipid A and saponin derivative, such as the combination of QS21 and 3D-MPL as described in WO 94/00153,

or a less reactogenic composition where the QS21 is quenched with cholesterol, as described in WO 96/33739. Other preferred formulations comprises an oil-in-water emulsion and tocopherol. A particularly potent adjuvant formulation involving QS21, 3D-MPL and tocopherol in an oil-in-water emulsion is described in WO 95/17210. Any vaccine provided herein may be prepared using well known methods that result in a combination of antigen, immune response enhancer and a suitable carrier or excipient.

The compositions described herein may be administered as part of a sustained release formulation (*i.e.*, a formulation such as a capsule, sponge or gel (composed of polysaccharides, for example) that effects a slow release of compound following administration). Such formulations may generally be prepared using well known technology and administered by, for example, oral, rectal or subcutaneous implantation, or by implantation at the desired target site. Sustained-release formulations may contain a polypeptide, polynucleotide or antibody dispersed in a carrier matrix and/or contained within a reservoir surrounded by a rate controlling membrane. Carriers for use within such formulations are biocompatible, and may also be biodegradable; preferably the formulation provides a relatively constant level of active component release. The amount of active compound contained within a sustained release formulation depends upon the site of implantation, the rate and expected duration of release and the nature of the condition to be treated or prevented.

Any of a variety of delivery vehicles may be employed within pharmaceutical compositions and vaccines to facilitate production of an antigen-specific immune response that targets tumor cells. Delivery vehicles include antigen presenting cells (APCs), such as dendritic cells, macrophages, B cells, monocytes and other cells that may be engineered to be efficient APCs. Such cells may, but need not, be genetically modified to increase the capacity for presenting the antigen, to improve activation and/or maintenance of the T cell response, to have anti-tumor effects *per se* and/or to be immunologically compatible with the receiver (*i.e.*, matched HLA haplotype). APCs may generally be isolated from any of a variety of biological fluids and organs, including tumor and peritumoral tissues, and may be autologous, allogeneic, syngeneic or xenogeneic cells.

Certain preferred embodiments of the present invention use dendritic cells

or progenitors thereof as antigen-presenting cells. Dendritic cells are highly potent APCs (Banchereau and Steinman, *Nature* 392:245-251, 1998) and have been shown to be effective as a physiological adjuvant for eliciting prophylactic or therapeutic antitumor immunity (*see* Timmerman and Levy, *Ann. Rev. Med.* 50:507-529, 1999). In general, dendritic cells may be identified based on their typical shape (stellate *in situ*, with marked cytoplasmic processes (dendrites) visible *in vitro*), their ability to take up, process and present antigens with high efficiency, and their ability to activate naïve T cell responses. Dendritic cells may, of course, be engineered to express specific cell-surface receptors or ligands that are not commonly found on dendritic cells *in vivo* or *ex vivo*, and such modified dendritic cells are contemplated by the present invention. As an alternative to dendritic cells, secreted vesicles antigen-loaded dendritic cells (called exosomes) may be used within a vaccine (*see* Zitvogel et al., *Nature Med.* 4:594-600, 1998).

Dendritic cells and progenitors may be obtained from peripheral blood, bone marrow, tumor-infiltrating cells, peritumoral tissues-infiltrating cells, lymph nodes, spleen, skin, umbilical cord blood or any other suitable tissue or fluid. For example, dendritic cells may be differentiated *ex vivo* by adding a combination of cytokines such as GM-CSF, IL-4, IL-13 and/or TNF α to cultures of monocytes harvested from peripheral blood. Alternatively, CD34 positive cells harvested from peripheral blood, umbilical cord blood or bone marrow may be differentiated into dendritic cells by adding to the culture medium combinations of GM-CSF, IL-3, TNF α , CD40 ligand, LPS, flt3 ligand and/or other compound(s) that induce differentiation, maturation and proliferation of dendritic cells.

Dendritic cells are conveniently categorized as "immature" and "mature" cells, which allows a simple way to discriminate between two well characterized phenotypes. However, this nomenclature should not be construed to exclude all possible intermediate stages of differentiation. Immature dendritic cells are characterized as APC with a high capacity for antigen uptake and processing, which correlates with the high expression of Fc γ receptor and mannose receptor. The mature phenotype is typically characterized by a lower expression of these markers, but a high expression of cell

surface molecules responsible for T cell activation such as class I and class II MHC, adhesion molecules (*e.g.*, CD54 and CD11) and costimulatory molecules (*e.g.*, CD40, CD80, CD86 and 4-1BB).

APCs may generally be transfected with a polynucleotide encoding a breast tumor protein (or portion or other variant thereof) such that the breast tumor polypeptide, or an immunogenic portion thereof, is expressed on the cell surface. Such transfection may take place *ex vivo*, and a composition or vaccine comprising such transfected cells may then be used for therapeutic purposes, as described herein. Alternatively, a gene delivery vehicle that targets a dendritic or other antigen presenting cell may be administered to a patient, resulting in transfection that occurs *in vivo*. *In vivo* and *ex vivo* transfection of dendritic cells, for example, may generally be performed using any methods known in the art, such as those described in WO 97/24447, or the gene gun approach described by Mahvi et al., *Immunology and cell Biology* 75:456-460, 1997. Antigen loading of dendritic cells may be achieved by incubating dendritic cells or progenitor cells with the breast tumor polypeptide, DNA (naked or within a plasmid vector) or RNA; or with antigen-expressing recombinant bacterium or viruses (*e.g.*, vaccinia, fowlpox, adenovirus or lentivirus vectors). Prior to loading, the polypeptide may be covalently conjugated to an immunological partner that provides T cell help (*e.g.*, a carrier molecule). Alternatively, a dendritic cell may be pulsed with a non-conjugated immunological partner, separately or in the presence of the polypeptide.

CANCER THERAPY

In further aspects of the present invention, the compositions described herein may be used for immunotherapy of cancer, such as breast cancer. Within such methods, pharmaceutical compositions and vaccines are typically administered to a patient. As used herein, a "patient" refers to any warm-blooded animal, preferably a human. A patient may or may not be afflicted with cancer. Accordingly, the above pharmaceutical compositions and vaccines may be used to prevent the development of a cancer or to treat a patient afflicted with a cancer. A cancer may be diagnosed using criteria generally accepted in the art, including the presence of a malignant tumor. Pharmaceutical compositions and vaccines may be administered either prior to or

following surgical removal of primary tumors and/or treatment such as administration of radiotherapy or conventional chemotherapeutic drugs.

Within certain embodiments, immunotherapy may be active immunotherapy, in which treatment relies on the *in vivo* stimulation of the endogenous host immune system to react against tumors with the administration of immune response-modifying agents (such as polypeptides and polynucleotides disclosed herein).

Within other embodiments, immunotherapy may be passive immunotherapy, in which treatment involves the delivery of agents with established tumor-immune reactivity (such as effector cells or antibodies) that can directly or indirectly mediate antitumor effects and does not necessarily depend on an intact host immune system. Examples of effector cells include T cells as discussed above, T lymphocytes (such as CD8⁺ cytotoxic T lymphocytes and CD4⁺ T-helper tumor-infiltrating lymphocytes), killer cells (such as Natural Killer cells and lymphokine-activated killer cells), B cells and antigen-presenting cells (such as dendritic cells and macrophages) expressing a polypeptide provided herein. T cell receptors and antibody receptors specific for the polypeptides recited herein may be cloned, expressed and transferred into other vectors or effector cells for adoptive immunotherapy. The polypeptides provided herein may also be used to generate antibodies or anti-idiotypic antibodies (as described above and in U.S. Patent No. 4,918,164) for passive immunotherapy.

Effector cells may generally be obtained in sufficient quantities for adoptive immunotherapy by growth *in vitro*, as described herein. Culture conditions for expanding single antigen-specific effector cells to several billion in number with retention of antigen recognition *in vivo* are well known in the art. Such *in vitro* culture conditions typically use intermittent stimulation with antigen, often in the presence of cytokines (such as IL-2) and non-dividing feeder cells. As noted above, immunoreactive polypeptides as provided herein may be used to rapidly expand antigen-specific T cell cultures in order to generate a sufficient number of cells for immunotherapy. In particular, antigen-presenting cells, such as dendritic, macrophage, monocyte, fibroblast or B cells, may be pulsed with immunoreactive polypeptides or transfected with one or more polynucleotides using standard techniques well known in the art. For example,

antigen-presenting cells can be transfected with a polynucleotide having a promoter appropriate for increasing expression in a recombinant virus or other expression system. Cultured effector cells for use in therapy must be able to grow and distribute widely, and to survive long term *in vivo*. Studies have shown that cultured effector cells can be induced to grow *in vivo* and to survive long term in substantial numbers by repeated stimulation with antigen supplemented with IL-2 (*see*, for example, Cheever et al., *Immunological Reviews* 157:177, 1997).

Alternatively, a vector expressing a polypeptide recited herein may be introduced into antigen presenting cells taken from a patient and clonally propagated *ex vivo* for transplant back into the same patient. Transfected cells may be reintroduced into the patient using any means known in the art, preferably in sterile form by intravenous, intracavitary, intraperitoneal or intratumor administration.

Routes and frequency of administration of the therapeutic compositions disclosed herein, as well as dosage, will vary from individual to individual, and may be readily established using standard techniques. In general, the pharmaceutical compositions and vaccines may be administered by injection (*e.g.*, intracutaneous, intramuscular, intravenous or subcutaneous), intranasally (*e.g.*, by aspiration) or orally. Preferably, between 1 and 10 doses may be administered over a 52 week period. Preferably, 6 doses are administered, at intervals of 1 month, and booster vaccinations may be given periodically thereafter. Alternate protocols may be appropriate for individual patients. A suitable dose is an amount of a compound that, when administered as described above, is capable of promoting an anti-tumor immune response, and is at least 10-50% above the basal (*i.e.*, untreated) level. Such response can be monitored by measuring the anti-tumor antibodies in a patient or by vaccine-dependent generation of cytolytic effector cells capable of killing the patient's tumor cells *in vitro*. Such vaccines should also be capable of causing an immune response that leads to an improved clinical outcome (*e.g.*, more frequent remissions, complete or partial or longer disease-free survival) in vaccinated patients as compared to non-vaccinated patients. In general, for pharmaceutical compositions and vaccines comprising one or more polypeptides, the amount of each polypeptide present in a dose ranges from about 100 μ g to 5 mg per kg of

host. Suitable dose sizes will vary with the size of the patient, but will typically range from about 0.1 mL to about 5 mL.

In general, an appropriate dosage and treatment regimen provides the active compound(s) in an amount sufficient to provide therapeutic and/or prophylactic benefit. Such a response can be monitored by establishing an improved clinical outcome (*e.g.*, more frequent remissions, complete or partial, or longer disease-free survival) in treated patients as compared to non-treated patients. Increases in preexisting immune responses to a breast tumor protein generally correlate with an improved clinical outcome. Such immune responses may generally be evaluated using standard proliferation, cytotoxicity or cytokine assays, which may be performed using samples obtained from a patient before and after treatment.

METHODS FOR DETECTING CANCER

In general, a cancer may be detected in a patient based on the presence of one or more breast tumor proteins and/or polynucleotides encoding such proteins in a biological sample (for example, blood, sera, urine and/or tumor biopsies) obtained from the patient. In other words, such proteins may be used as markers to indicate the presence or absence of a cancer such as breast cancer. In addition, such proteins may be useful for the detection of other cancers. The binding agents provided herein generally permit detection of the level of antigen that binds to the agent in the biological sample. Polynucleotide primers and probes may be used to detect the level of mRNA encoding a tumor protein, which is also indicative of the presence or absence of a cancer. In general, a breast tumor sequence should be present at a level that is at least three fold higher in tumor tissue than in normal tissue.

There are a variety of assay formats known to those of ordinary skill in the art for using a binding agent to detect polypeptide markers in a sample. *See, e.g.*, Harlow and Lane, *Antibodies: A Laboratory Manual*, Cold Spring Harbor Laboratory, 1988. In general, the presence or absence of a cancer in a patient may be determined by (a) contacting a biological sample obtained from a patient with a binding agent; (b) detecting in the sample a level of polypeptide that binds to the binding agent; and (c) comparing the level of polypeptide with a predetermined cut-off value.

In a preferred embodiment, the assay involves the use of binding agent immobilized on a solid support to bind to and remove the polypeptide from the remainder of the sample. The bound polypeptide may then be detected using a detection reagent that contains a reporter group and specifically binds to the binding agent/polypeptide complex. Such detection reagents may comprise, for example, a binding agent that specifically binds to the polypeptide or an antibody or other agent that specifically binds to the binding agent, such as an anti-immunoglobulin, protein G, protein A or a lectin. Alternatively, a competitive assay may be utilized, in which a polypeptide is labeled with a reporter group and allowed to bind to the immobilized binding agent after incubation of the binding agent with the sample. The extent to which components of the sample inhibit the binding of the labeled polypeptide to the binding agent is indicative of the reactivity of the sample with the immobilized binding agent. Suitable polypeptides for use within such assays include full length breast tumor proteins and portions thereof to which the binding agent binds, as described above.

The solid support may be any material known to those of ordinary skill in the art to which the tumor protein may be attached. For example, the solid support may be a test well in a microtiter plate or a nitrocellulose or other suitable membrane. Alternatively, the support may be a bead or disc, such as glass, fiberglass, latex or a plastic material such as polystyrene or polyvinylchloride. The support may also be a magnetic particle or a fiber optic sensor, such as those disclosed, for example, in U.S. Patent No. 5,359,681. The binding agent may be immobilized on the solid support using a variety of techniques known to those of skill in the art, which are amply described in the patent and scientific literature. In the context of the present invention, the term "immobilization" refers to both noncovalent association, such as adsorption, and covalent attachment (which may be a direct linkage between the agent and functional groups on the support or may be a linkage by way of a cross-linking agent). Immobilization by adsorption to a well in a microtiter plate or to a membrane is preferred. In such cases, adsorption may be achieved by contacting the binding agent, in a suitable buffer, with the solid support for a suitable amount of time. The contact time varies with temperature, but is typically between about 1 hour and about 1 day. In general, contacting a well of a plastic microtiter plate (such as polystyrene or polyvinylchloride) with an amount of

binding agent ranging from about 10 ng to about 10 μ g, and preferably about 100 ng to about 1 μ g, is sufficient to immobilize an adequate amount of binding agent.

Covalent attachment of binding agent to a solid support may generally be achieved by first reacting the support with a bifunctional reagent that will react with both the support and a functional group, such as a hydroxyl or amino group, on the binding agent. For example, the binding agent may be covalently attached to supports having an appropriate polymer coating using benzoquinone or by condensation of an aldehyde group on the support with an amine and an active hydrogen on the binding partner (*see, e.g.*, Pierce Immunotechnology Catalog and Handbook, 1991, at A12-A13).

In certain embodiments, the assay is a two-antibody sandwich assay. This assay may be performed by first contacting an antibody that has been immobilized on a solid support, commonly the well of a microtiter plate, with the sample, such that polypeptides within the sample are allowed to bind to the immobilized antibody. Unbound sample is then removed from the immobilized polypeptide-antibody complexes and a detection reagent (preferably a second antibody capable of binding to a different site on the polypeptide) containing a reporter group is added. The amount of detection reagent that remains bound to the solid support is then determined using a method appropriate for the specific reporter group.

More specifically, once the antibody is immobilized on the support as described above, the remaining protein binding sites on the support are typically blocked. Any suitable blocking agent known to those of ordinary skill in the art, such as bovine serum albumin or Tween 20™ (Sigma Chemical Co., St. Louis, MO). The immobilized antibody is then incubated with the sample, and polypeptide is allowed to bind to the antibody. The sample may be diluted with a suitable diluent, such as phosphate-buffered saline (PBS) prior to incubation. In general, an appropriate contact time (*i.e.*, incubation time) is a period of time that is sufficient to detect the presence of polypeptide within a sample obtained from an individual with breast cancer. Preferably, the contact time is sufficient to achieve a level of binding that is at least about 95% of that achieved at equilibrium between bound and unbound polypeptide. Those of ordinary skill in the art will recognize that the time necessary to achieve equilibrium may be readily determined

by assaying the level of binding that occurs over a period of time. At room temperature, an incubation time of about 30 minutes is generally sufficient.

Unbound sample may then be removed by washing the solid support with an appropriate buffer, such as PBS containing 0.1% Tween 20™. The second antibody, which contains a reporter group, may then be added to the solid support. Preferred reporter groups include those groups recited above.

The detection reagent is then incubated with the immobilized antibody-polypeptide complex for an amount of time sufficient to detect the bound polypeptide. An appropriate amount of time may generally be determined by assaying the level of binding that occurs over a period of time. Unbound detection reagent is then removed and bound detection reagent is detected using the reporter group. The method employed for detecting the reporter group depends upon the nature of the reporter group. For radioactive groups, scintillation counting or autoradiographic methods are generally appropriate. Spectroscopic methods may be used to detect dyes, luminescent groups and fluorescent groups. Biotin may be detected using avidin, coupled to a different reporter group (commonly a radioactive or fluorescent group or an enzyme). Enzyme reporter groups may generally be detected by the addition of substrate (generally for a specific period of time), followed by spectroscopic or other analysis of the reaction products.

To determine the presence or absence of a cancer, such as breast cancer, the signal detected from the reporter group that remains bound to the solid support is generally compared to a signal that corresponds to a predetermined cut-off value. In one preferred embodiment, the cut-off value for the detection of a cancer is the average mean signal obtained when the immobilized antibody is incubated with samples from patients without the cancer. In general, a sample generating a signal that is three standard deviations above the predetermined cut-off value is considered positive for the cancer. In an alternate preferred embodiment, the cut-off value is determined using a Receiver Operator Curve, according to the method of Sackett et al., *Clinical Epidemiology: A Basic Science for Clinical Medicine*, Little Brown and Co., 1985, p. 106-7. Briefly, in this embodiment, the cut-off value may be determined from a plot of pairs of true positive rates (*i.e.*, sensitivity) and false positive rates (100%-specificity) that correspond

to each possible cut-off value for the diagnostic test result. The cut-off value on the plot that is the closest to the upper left-hand corner (*i.e.*, the value that encloses the largest area) is the most accurate cut-off value, and a sample generating a signal that is higher than the cut-off value determined by this method may be considered positive. Alternatively, the cut-off value may be shifted to the left along the plot, to minimize the false positive rate, or to the right, to minimize the false negative rate. In general, a sample generating a signal that is higher than the cut-off value determined by this method is considered positive for a cancer.

In a related embodiment, the assay is performed in a flow-through or strip test format, wherein the binding agent is immobilized on a membrane, such as nitrocellulose. In the flow-through test, polypeptides within the sample bind to the immobilized binding agent as the sample passes through the membrane. A second, labeled binding agent then binds to the binding agent-polypeptide complex as a solution containing the second binding agent flows through the membrane. The detection of bound second binding agent may then be performed as described above. In the strip test format, one end of the membrane to which binding agent is bound is immersed in a solution containing the sample. The sample migrates along the membrane through a region containing second binding agent and to the area of immobilized binding agent. Concentration of second binding agent at the area of immobilized antibody indicates the presence of a cancer. Typically, the concentration of second binding agent at that site generates a pattern, such as a line, that can be read visually. The absence of such a pattern indicates a negative result. In general, the amount of binding agent immobilized on the membrane is selected to generate a visually discernible pattern when the biological sample contains a level of polypeptide that would be sufficient to generate a positive signal in the two-antibody sandwich assay, in the format discussed above. Preferred binding agents for use in such assays are antibodies and antigen-binding fragments thereof. Preferably, the amount of antibody immobilized on the membrane ranges from about 25 ng to about 1 μ g, and more preferably from about 50 ng to about 500 ng. Such tests can typically be performed with a very small amount of biological sample.

Of course, numerous other assay protocols exist that are suitable for use with the tumor proteins or binding agents of the present invention. The above descriptions are intended to be exemplary only. For example, it will be apparent to those of ordinary skill in the art that the above protocols may be readily modified to use breast tumor polypeptides to detect antibodies that bind to such polypeptides in a biological sample. The detection of such breast tumor protein specific antibodies may correlate with the presence of a cancer.

A cancer may also, or alternatively, be detected based on the presence of T cells that specifically react with a breast tumor protein in a biological sample. Within certain methods, a biological sample comprising CD4⁺ and/or CD8⁺ T cells isolated from a patient is incubated with a breast tumor polypeptide, a polynucleotide encoding such a polypeptide and/or an APC that expresses at least an immunogenic portion of such a polypeptide, and the presence or absence of specific activation of the T cells is detected. Suitable biological samples include, but are not limited to, isolated T cells. For example, T cells may be isolated from a patient by routine techniques (such as by Ficoll/Hypaque density gradient centrifugation of peripheral blood lymphocytes). T cells may be incubated *in vitro* for 2-9 days (typically 4 days) at 37°C with polypeptide (*e.g.*, 5 - 25 µg/ml). It may be desirable to incubate another aliquot of a T cell sample in the absence of breast tumor polypeptide to serve as a control. For CD4⁺ T cells, activation is preferably detected by evaluating proliferation of the T cells. For CD8⁺ T cells, activation is preferably detected by evaluating cytolytic activity. A level of proliferation that is at least two fold greater and/or a level of cytolytic activity that is at least 20% greater than in disease-free patients indicates the presence of a cancer in the patient.

As noted above, a cancer may also, or alternatively, be detected based on the level of mRNA encoding a breast tumor protein in a biological sample. For example, at least two oligonucleotide primers may be employed in a polymerase chain reaction (PCR) based assay to amplify a portion of a breast tumor cDNA derived from a biological sample, wherein at least one of the oligonucleotide primers is specific for (*i.e.*, hybridizes to) a polynucleotide encoding the breast tumor protein. The amplified cDNA is then separated and detected using techniques well known in the art, such as gel electrophoresis. Similarly, oligonucleotide probes that specifically hybridize to a polynucleotide encoding a breast tumor protein may be used in a hybridization assay to detect the presence of polynucleotide encoding the tumor protein in a biological sample.

To permit hybridization under assay conditions, oligonucleotide primers and probes should comprise an oligonucleotide sequence that has at least about 60%, preferably at least about 75% and more preferably at least about 90%, identity to a portion of a polynucleotide encoding a breast tumor protein that is at least 10 nucleotides,

and preferably at least 20 nucleotides, in length. Preferably, oligonucleotide primers and/or probes will hybridize to a polynucleotide encoding a polypeptide disclosed herein under moderately stringent conditions, as defined above. Oligonucleotide primers and/or probes which may be usefully employed in the diagnostic methods described herein preferably are at least 10-40 nucleotides in length. In a preferred embodiment, the oligonucleotide primers comprise at least 10 contiguous nucleotides, more preferably at least 15 contiguous nucleotides, of a DNA molecule having a sequence recited in SEQ ID NOS:1-175, 178, 180 and 182-468. Techniques for both PCR based assays and hybridization assays are well known in the art (*see*, for example, Mullis et al., *Cold Spring Harbor Symp. Quant. Biol.*, 51:263, 1987; Erlich ed., *PCR Technology*, Stockton Press, NY, 1989).

One preferred assay employs RT-PCR, in which PCR is applied in conjunction with reverse transcription. Typically, RNA is extracted from a biological sample, such as biopsy tissue, and is reverse transcribed to produce cDNA molecules. PCR amplification using at least one specific primer generates a cDNA molecule, which may be separated and visualized using, for example, gel electrophoresis. Amplification may be performed on biological samples taken from a test patient and from an individual who is not afflicted with a cancer. The amplification reaction may be performed on several dilutions of cDNA spanning two orders of magnitude. A two-fold or greater increase in expression in several dilutions of the test patient sample as compared to the same dilutions of the non-cancerous sample is typically considered positive.

In another embodiment, the disclosed compositions may be used as markers for the progression of cancer. In this embodiment, assays as described above for the diagnosis of a cancer may be performed over time, and the change in the level of reactive polypeptide(s) or polynucleotide evaluated. For example, the assays may be performed every 24-72 hours for a period of 6 months to 1 year, and thereafter performed as needed. In general, a cancer is progressing in those patients in whom the level of polypeptide or polynucleotide detected increases over time. In contrast, the cancer is not progressing when the level of reactive polypeptide or polynucleotide either remains constant or decreases with time.

Certain *in vivo* diagnostic assays may be performed directly on a tumor.

One such assay involves contacting tumor cells with a binding agent. The bound binding agent may then be detected directly or indirectly via a reporter group. Such binding agents may also be used in histological applications. Alternatively, polynucleotide probes may be used within such applications.

As noted above, to improve sensitivity, multiple breast tumor protein markers may be assayed within a given sample. It will be apparent that binding agents specific for different proteins provided herein may be combined within a single assay. Further, multiple primers or probes may be used concurrently. The selection of tumor protein markers may be based on routine experiments to determine combinations that results in optimal sensitivity. In addition, or alternatively, assays for tumor proteins provided herein may be combined with assays for other known tumor antigens.

DIAGNOSTIC KITS

The present invention further provides kits for use within any of the above diagnostic methods. Such kits typically comprise two or more components necessary for performing a diagnostic assay. Components may be compounds, reagents, containers and/or equipment. For example, one container within a kit may contain a monoclonal antibody or fragment thereof that specifically binds to a breast tumor protein. Such antibodies or fragments may be provided attached to a support material, as described above. One or more additional containers may enclose elements, such as reagents or buffers, to be used in the assay. Such kits may also, or alternatively, contain a detection reagent as described above that contains a reporter group suitable for direct or indirect detection of antibody binding.

Alternatively, a kit may be designed to detect the level of mRNA encoding a breast tumor protein in a biological sample. Such kits generally comprise at least one oligonucleotide probe or primer, as described above, that hybridizes to a polynucleotide encoding a breast tumor protein. Such an oligonucleotide may be used, for example, within a PCR or hybridization assay. Additional components that may be present within such kits include a second oligonucleotide and/or a diagnostic reagent or container to facilitate the detection of a polynucleotide encoding a breast tumor protein.

The following Examples are offered by way of illustration and not by way of limitation.

EXAMPLES

Example 1

ISOLATION AND CHARACTERIZATION OF BREAST TUMOR POLYPEPTIDES

This Example describes the isolation of breast tumor polypeptides from a breast tumor cDNA library.

A cDNA subtraction library containing cDNA from breast tumor subtracted with normal breast cDNA was constructed as follows. Total RNA was extracted from primary tissues using Trizol reagent (Gibco BRL Life Technologies, Gaithersburg, MD) as described by the manufacturer. The polyA+ RNA was purified using an oligo(dT) cellulose column according to standard protocols. First strand cDNA was synthesized using the primer supplied in a Clontech PCR-Select cDNA Subtraction Kit (Clontech, Palo Alto, CA). The driver DNA consisted of cDNAs from two normal breast tissues with the tester cDNA being from three primary breast tumors. Double-stranded cDNA was synthesized for both tester and driver, and digested with a combination of endonucleases (MluI, MscI, PvuII, SalI and StuI) which recognize six base pairs DNA. This modification increased the average cDNA size dramatically compared with cDNAs generated according to the protocol of Clontech (Palo Alto, CA). The digested tester cDNAs were ligated to two different adaptors and the subtraction was performed according to Clontech's protocol. The subtracted cDNAs were subjected to two rounds of PCR amplification, following the manufacturer's protocol. The resulting PCR products were subcloned into the TA cloning vector, pCRII (Invitrogen, San Diego, CA) and transformed into ElectroMax *E. coli* DH10B cells (Gibco BRL Life, Technologies) by electroporation. DNA was isolated from independent clones and sequenced using a Perkin Elmer/Applied Biosystems Division (Foster City, CA) Automated Sequencer Model 373A.

Sixty-three distinct cDNA clones were found in the subtracted breast tumor-specific cDNA library. The determined one strand (5' or 3') cDNA sequences for the clones are provided in SEQ ID NO: 1-61, 72 and 73, respectively. Comparison of these cDNA sequences with known sequences in the gene bank using the EMBL and GenBank databases (Release 97) revealed no significant homologies to the sequences provided in SEQ ID NO: 14, 21, 22, 27, 29, 30, 32, 38, 44, 45, 53, 72 and 73. The sequences of SEQ ID NO: 1, 3, 16, 17, 34, 48, 57, 60 and 61 were found to represent known human genes. The sequences of SEQ ID NO: 2, 4, 23, 39 and 50 were found to show some similarity to previously identified non-human genes. The remaining clones (SEQ ID NO: 5-13, 15, 18-20, 24-26, 28, 31, 33, 35-37, 40-43, 46, 47, 49, 51, 52, 54-56, 58 and 59) were found to show at least some degree of homology to previously identified expressed sequence tags (ESTs).

To determine mRNA expression levels of the isolated cDNA clones, cDNA clones from the breast subtraction described above were randomly picked and colony PCR amplified. Their mRNA expression levels in breast tumor, normal breast and various other normal tissues were determined using microarray technology (Synteni, Palo Alto, CA). Briefly, the PCR amplification products were arrayed onto slides in an array format, with each product occupying a unique location in the array. mRNA was extracted from the tissue sample to be tested, reverse transcribed, and fluorescent-labeled cDNA probes were generated. The microarrays were probed with the labeled cDNA probes, the slides scanned and fluorescence intensity was measured. Data was analyzed using Synteni provided GEMTOOLS Software. Of the seventeen cDNA clones examined, those of SEQ ID NO: 40, 46, 59 and 73 were found to be over-expressed in breast tumor and expressed at low levels in all normal tissues tested (breast, PBMC, colon, fetal tissue, salivary gland, bone marrow, lung, pancreas, large intestine, spinal cord, adrenal gland, kidney, pancreas, liver, stomach, skeletal muscle, heart, small intestine, skin, brain and human mammary epithelial cells). The clones of SEQ ID NO: 41 and 48 were found to be over-expressed in breast tumor and expressed at low levels in all other tissues tested, with the exception of bone marrow. The clone of SEQ ID NO: 42 was found to be over-expressed in breast tumor and expressed at low levels in all other tissues tested except bone marrow and spinal cord. The clone of SEQ ID NO: 43 was

found to be over-expressed in breast tumor and expressed at low levels in all other tissues tested with the exception of spinal cord, heart and small intestine. The clone of SEQ ID NO: 51 was found to be over-expressed in breast tumor and expressed at low levels in all other tissues tested with the exception of large intestine. The clone of SEQ ID NO: 54 was found to be over-expressed in breast tumor and expressed at low levels in all other tissues tested with the exception of PBMC, stomach and small intestine. The clone of SEQ ID NO: 56 was found to be over-expressed in breast tumor and expressed at low levels in all other tissues tested with the exception of large and small intestine, human mammary epithelia cells and SCID mouse-passaged breast tumor. The clone of SEQ ID NO: 60 was found to be over-expressed in breast tumor and expressed at low levels in all other tissues tested with the exception of spinal cord and heart. The clone of SEQ ID NO: 61 was found to be over-expressed in breast tumor and expressed at low levels in all other tissues tested with the exception of small intestine. The clone of SEQ ID NO: 72 was found to be over-expressed in breast tumor and expressed at low levels in all other tissues tested with the exception of colon and salivary gland.

The results of a Northern blot analysis of the clone SYN18C6 (SEQ ID NO: 40) are shown in Fig. 1. A predicted protein sequence encoded by SYN18C6 is provided in SEQ ID NO: 62.

Additional cDNA clones that are over-expressed in breast tumor tissue were isolated from breast cDNA subtraction libraries as follows. Breast subtraction libraries were prepared, as described above, by PCR-based subtraction employing pools of breast tumor cDNA as the tester and pools of either normal breast cDNA or cDNA from other normal tissues as the driver. cDNA clones from breast subtraction were randomly picked and colony PCR amplified and their mRNA expression levels in breast tumor, normal breast and various other normal tissues were determined using the microarray technology described above. Twenty-four distinct cDNA clones were found to be over-expressed in breast tumor and expressed at low levels in all normal tissues tested (breast, brain, liver, pancreas, lung, salivary gland, stomach, colon, kidney, bone marrow, skeletal muscle, PBMC, heart, small intestine, adrenal gland, spinal cord, large intestine and skin). The determined partial cDNA sequences for these clones are provided in SEQ ID NO: 63-87. Comparison of the sequences of SEQ ID NO: 74-87

with those in the gene bank as described above, revealed homology to previously identified human genes. No significant homologies were found to the sequences of SEQ ID NO: 63-73.

Three DNA isoforms for the clone B726P (partial sequence provided in SEQ ID NO: 71) were isolated as follows. A radioactive probe was synthesized from B726P by excising B726P DNA from a pT7Blue vector (Novagen) by a BamHI/XbaI restriction digest and using the resulting DNA as the template in a single-stranded PCR in the presence of [α -³²P]dCTP. The sequence of the primer employed for this PCR is provided in SEQ ID NO: 177. The resulting radioactive probe was used to probe a directional cDNA library and a random-primed cDNA library made using RNA isolated from breast tumors. Eighty-five clones were identified, excised, purified and sequenced. Of these 85 clones, three were found to each contain a significant open reading frame. The determined cDNA sequence of the isoform B726P-20 is provided in SEQ ID NO: 175, with the corresponding predicted amino acid sequence being provided in SEQ ID NO: 176. The determined cDNA sequence of the isoform B726P-74 is provided in SEQ ID NO: 178, with the corresponding predicted amino acid sequence being provided in SEQ ID NO: 179. The determined cDNA sequence of the isoform B726P-79 is provided in SEQ ID NO: 180, with the corresponding predicted amino acid sequence being provided in SEQ ID NO: 181.

Efforts to obtain a full-length clone of B726P using standard techniques led to the isolation of five additional clones that represent additional 5' sequence of B726P. These clones appear to be alternative splice forms of the same gene. The determined cDNA sequences of these clones are provided in SEQ ID NO: 464-468, with the predicted amino acid sequences encoded by SEQ ID NO: 464-467 being provided in SEQ ID NO: 470-473, respectively. Using standard computer techniques, a 3,681 bp consensus DNA sequence (SEQ ID NO: 463) was created that contains two large open reading frames. The downstream ORF encodes the predicted amino acid sequence of SEQ ID NO: 181. The predicted amino acid sequence encoded by the upstream ORF is provided in SEQ ID NO: 469.

Further isolation of individual clones that are over-expressed in breast tumor tissue was conducted using cDNA subtraction library techniques described above. In particular, a cDNA subtraction library containing cDNA from breast tumors subtracted with five other normal human tissue cDNAs (brain, liver, PBMC, pancreas and normal breast) was utilized in this screening. From the original subtraction, one hundred seventy seven clones were selected to be further characterized by DNA sequencing and microarray analysis. Microarray analysis demonstrated that the sequences in SEQ ID NO: 182-251 were 2 or more fold over-expressed in human breast tumor tissues over normal human tissues. No significant homologies were found for nineteen of these clones, including, SEQ ID NO: 185, 186, 194, 199, 205, 208, 211, 214-216, 219, 222, 226, 232, 236, 240, 241, 245 and 246, with the exception of some previously identified expressed sequence tags (ESTs). The remaining clones share some homology to previously identified genes, specifically SEQ ID NO: 181-184, 187-193, 195-198, 200-204, 206, 207, 209, 210, 212, 213, 217, 218, 220, 221, 223-225, 227-231, 233-235, 237-239, 242-244 and 247-251.

Of the seventy clones showing over-expression in breast tumor tissues, fifteen demonstrated particularly good expression levels in breast tumor over normal human tissues. The following eleven clones did not show any significant homology to any known genes. Clone 19463.1 (SEQ ID NO: 185) was over-expressed in the majority of breast tumors and also in the SCID breast tumors tested (refer to Example 2); additionally, over-expression was found in a majority of normal breast tissues. Clone 19483.1 (SEQ ID NO: 216) was over-expressed in a few breast tumors, with no over-expression in any normal tissues tested. Clone 19470.1 (SEQ ID NO: 219) was found to be slightly over-expressed in some breast tumors. Clone 19468.1 (SEQ ID NO: 222) was found to be slightly over-expressed in the majority of breast tumors tested. Clone 19505.1 (SEQ ID NO: 226) was found to be slightly over-expressed in 50% of breast tumors, as well as in SCID tumor tissues, with some degree of over-expression in found in normal breast. Clone 1509.1 (SEQ ID NO: 232) was found to be over-expressed in very few breast tumors, but with a certain degree of over-expression in metastatic breast tumor tissues, as well as no significant over-expression found in normal tissues. Clone 19513.1 (SEQ ID NO: 236) was shown to be slightly over-expressed in few breast

tumors, with no significant over-expression levels found in normal tissues. Clone 19575.1 (SEQ ID NO: 240) showed low level over-expression in some breast tumors and also in normal breast. Clone 19560.1 (SEQ ID NO: 241) was over-expressed in 50% of breast tumors tested, as well as in some normal breast tissues. Clone 19583.1 (SEQ ID NO: 245) was slightly over-expressed in some breast tumors, with very low levels of over-expression found in normal tissues. Clone 19587.1 (SEQ ID NO: 246) showed low level over-expression in some breast tumors and no significant over-expression in normal tissues.

Clone 19520.1 (SEQ ID NO: 233), showing homology to clone 102D24 on chromosome 11q13.31, was found to be over-expressed in breast tumors and in SCID tumors. Clone 19517.1 (SEQ ID NO: 237), showing homology to human PAC 128M19 clone, was found to be slightly over-expressed in the majority of breast tumors tested. Clone 19392.2 (SEQ ID NO: 247), showing homology to human chromosome 17, was shown to be over-expressed in 50% of breast tumors tested. Clone 19399.2 (SEQ ID NO: 250), showing homology to human Xp22 BAC GSHB-184P14, was shown to be slightly over-expressed in a limited number of breast tumors tested.

In subsequent studies, 64 individual clones were isolated from a subtracted cDNA library containing cDNA from a pool of breast tumors subtracted with cDNA from five normal tissues (brain, liver, PBMC, pancreas and normal breast). The subtracted cDNA library was prepared as described above with the following modification. A combination of five six-base cutters (MluI, MscI, PvuII, SalI and StuI) was used to digest the cDNA instead of RsaI. This resulted in an increase in the average insert size from 300 bp to 600 bp. The 64 isolated clones were colony PCR amplified and their mRNA expression levels in breast tumor tissue, normal breast and various other normal tissues were examined by microarray technology as described above. The determined cDNA sequences of 11 clones which were found to be over-expressed in breast tumor tissue are provided in SEQ ID NO: 405-415. Comparison of these sequences to those in the public database, as outlined above, revealed homologies between the sequences of SEQ ID NO: 408, 411, 413 and 414 and previously isolated ESTs. The sequences of SEQ ID NO: 405-407, 409, 410, 412 and 415 were found to show some homology to previously identified sequences.

In further studies, a subtracted cDNA library was prepared from cDNA from metastatic breast tumors subtracted with a pool of cDNA from five normal tissues (breast, brain, lung, pancreas and PBMC) using the PCR-subtraction protocol of Clontech, described above. The determined cDNA sequences of 90 clones isolated from this library are provided in SEQ ID NO: 315-404. Comparison of these sequences with those in the public database, as described above, revealed no significant homologies to the sequence of SEQ ID NO: 366. The sequences of SEQ ID NO: 320-324, 342, 353, 367, 368, 377, 382, 385, 389, 395, 397 and 400 were found to show some homology to previously isolated ESTs. The remaining sequences were found to show homology to previously identified gene sequences.

In yet further studies, a subtracted cDNA library (referred to as 2BT) was prepared from cDNA from breast tumors subtracted with a pool of cDNA from six normal tissues (liver, brain, stomach, small intestine, kidney and heart) using the PCR-subtraction protocol of Clontech, described above. cDNA clones isolated from this subtraction were subjected to DNA microarray analysis as described above and the resulting data subjected to four modified Gemtools analyses. The first analysis compared 28 breast tumors with 28 non-breast normal tissues. A mean over-expression of at least 2.1 fold was used as a selection cut-off. The second analysis compared 6 metastatic breast tumors with 29 non-breast normal tissues. A mean over-expression of at least 2.5 fold was used as a cut-off. The third and fourth analyses compared 2 early SCID mouse-passaged with 2 late SCID mouse-passaged tumors. A mean over-expression in the early or late passaged tumors of 2.0 fold or greater was used as a cut-off. In addition, a visual analysis was performed on the microarray data for the 2BT clones. The determined cDNA sequences of 13 clones identified in the visual analysis are provided in SEQ ID NO: 427-439. The determined cDNA sequences of 22 clones identified using the modified Gemtools analysis are provided in SEQ ID NO: 440-462, wherein SEQ ID NO: 453 and 454 represent two partial, non-overlapping, sequences of the same clone.

Comparison of the clone sequences of SEQ ID NO: 436 and 437 (referred to as 263G6 and 262B2) with those in the public databases, as described above, revealed no significant homologies to previously identified sequences. The sequences of SEQ ID NO: 427, 429, 431, 435, 438, 441, 443, 444, 445, 446, 450, 453 and 454 (referred to as

266B4, 266G3, 264B4, 263G1, 262B6, 2BT2-34, 2BT1-77, 2BT1-62, 2BT1-60,61, 2BT1-59, 2BT1-52 and 2BT1-40, respectively) showed some homology to previously isolated expressed sequences tags (ESTs). The sequences of SEQ ID NO: 428, 430, 432, 433, 434, 439, 440, 442, 447, 448, 449, 451, 452 and 455-462 (referred to as clones 22892, 22890, 22883, 22882, 22880, 22869, 21374, 21349, 21093, 21091, 21089, 21085, 21084, 21063, 21062, 21060, 21053, 21050, 21036, 21037 and 21048, respectively), showed some homology to gene sequences previously identified in humans.

Example 2

ISOLATION AND CHARACTERIZATION OF BREAST TUMOR POLYPEPTIDES OBTAINED BY PCR-BASED SUBTRACTION USING SCID-PASSAGED TUMOR RNA

Human breast tumor antigens were obtained by PCR-based subtraction using SCID mouse passaged breast tumor RNA as follows. Human breast tumor was implanted in SCID mice and harvested on the first or sixth serial passage, as described in Patent Application Serial No. 08/556,659 filed 11/13/95, U.S. Patent No. _____. Genes found to be differentially expressed between early and late passage SCID tumor may be stage specific and therefore useful in therapeutic and diagnostic applications. Total RNA was prepared from snap frozen SCID passaged human breast tumor from both the first and sixth passage.

PCR-based subtraction was performed essentially as described above. In the first subtraction (referred to as T9), RNA from first passage tumor was subtracted from sixth passage tumor RNA to identify more aggressive, later passage-specific antigens. Of the 64 clones isolated and sequenced from this subtraction, no significant homologies were found to 30 of these clones, hereinafter referred to as: 13053, 13057, 13059, 13065, 13067, 13068, 13071-13073, 13075, 13078, 13079, 13081, 13082, 13092, 13097, 13101, 13102, 13131, 13133, 13119, 13135, 13139, 13140, 13146-13149, and 13151, with the exception of some previously identified expressed sequence tags (ESTs). The determined cDNA sequences for these clones are provided in SEQ ID NO: 88-116,

respectively. The isolated cDNA sequences of SEQ ID NO: 117-140 showed homology to known genes.

In a second PCR-based subtraction, RNA from sixth passage tumor was subtracted from first passage tumor RNA to identify antigens down-regulated over multiple passages. Of the 36 clones isolated and sequenced, no significant homologies were found to nineteen of these clones, hereinafter referred to as: 14376, 14377, 14383, 14384, 14387, 14392, 14394, 14398, 14401, 14402, 14405, 14409, 14412, 14414-14416, 14419, 14426, and 14427, with the exception of some previously identified expressed sequence tags (ESTs). The determined cDNA sequences for these clones are provided in SEQ ID NO: 141-159, respectively. The isolated cDNA sequences of SEQ ID NO: 160-174 were found to show homology to previously known genes.

Further analysis of human breast tumor antigens through PCR-based subtraction using first and sixth passage SCID tumor RNA was performed. Sixty three clones were found to be differentially expressed by a two or more fold margin, as determined by microarray analysis, i.e., higher expression in early passage tumor over late passage tumor, or vice versa.. Seventeen of these clones showed no significant homology to any known genes, although some degree of homology with previously identified expressed sequence tags (ESTs) was found, hereinafter referred to as 20266, 20270, 20274, 20276, 20277, 20280, 20281, 20294, 20303, 20310, 20336, 20341, 20941, 20954, 20961, 20965 and 20975 (SEQ ID NO: 252-268, respectively). The remaining clones were found to share some degree of homology to known genes, which are identified in the Brief Description of the Drawings and Sequence Identifiers section above, hereinafter referred to as 20261, 20262, 20265, 20267, 20268, 20271, 20272, 20273, 20278, 20279, 20293, 20300, 20305, 20306, 20307, 20313, 20317, 20318, 20320, 20321, 20322, 20326, 20333, 20335, 20337, 20338, 20340, 20938, 20939, 20940, 20942, 20943, 20944, 20946, 20947, 20948, 20949, 20950, 20951, 20952, 20957, 20959, 20966, 20976, 20977 and 20978. The determined cDNA sequences for these clones are provided in SEQ ID NO: 269-313, respectively.

The clones 20310, 20281, 20262, 20280, 20303, 20336, 20270, 20341, 20326 and 20977 (also referred to as B820P, B821P, B822P, B823P, B824P, B825P, B826P, B827P, B828P and B829P, respectively) were selected for further analysis based

on the results obtained with microarray analysis. Specifically, microarray data analysis indicated at least two- to three-fold overexpression of these clones in breast tumor RNA compared to normal tissues tested. Subsequent studies led to the determination of the complete insert sequence for the clones B820P, B821P, B822P, B823P, B824P, B825P, B826P, B827P, B828P and B829P. These extended cDNA sequences are provided in SEQ ID NO: 416-426, respectively.

Example 3

SYNTHESIS OF POLYPEPTIDES

Polypeptides may be synthesized on an Perkin Elmer/Applied Biosystems Division 430A peptide synthesizer using Fmoc chemistry with HPTU (O-Benzotriazole-N,N,N',N'-tetramethyluronium hexafluorophosphate) activation. A Gly-Cys-Gly sequence may be attached to the amino terminus of the peptide to provide a method of conjugation, binding to an immobilized surface, or labeling of the peptide. Cleavage of the peptides from the solid support may be carried out using the following cleavage mixture: trifluoroacetic acid:ethanedithiol:thioanisole:water:phenol (40:1:2:2:3). After cleaving for 2 hours, the peptides may be precipitated in cold methyl-t-butyl-ether. The peptide pellets may then be dissolved in water containing 0.1% trifluoroacetic acid (TFA) and lyophilized prior to purification by C18 reverse phase HPLC. A gradient of 0%-60% acetonitrile (containing 0.1% TFA) in water (containing 0.1% TFA) may be used to elute the peptides. Following lyophilization of the pure fractions, the peptides may be characterized using electrospray or other types of mass spectrometry and by amino acid analysis.

From the foregoing, it will be appreciated that, although specific embodiments of the invention have been described herein for the purposes of illustration, various modifications may be made without deviating from the spirit and scope of the invention.

Claims

1. An isolated polypeptide comprising at least an immunogenic portion of a breast tumor protein, or a variant thereof, wherein the tumor protein comprises an amino acid sequence that is encoded by a polynucleotide sequence selected from the group consisting of:

(a) sequences recited in SEQ ID NOS: 2, 4-15, 18-33, 35-47, 49-56, 58, 59, 63-73, 88-116, 141-159, 175, 178, 180, 185, 186, 194, 199, 205, 208, 211, 214-216, 219, 222, 226, 232, 236, 240, 241, 245, 246, 252-268, 320-324, 342, 353, 366-368, 377, 382, 385, 389, 395, 397, 400, 408, 411, 413, 414, 416, 417, 419-423, 426, 427, 429, 431, 435-438, 441, 443-446, 450, 453, 454 and 463-468;

(b) sequences that hybridize to a sequence of SEQ ID NOS: 2, 4-15, 18-33, 35-47, 49-56, 58, 59, 63-73, 88-116, 141-159, 175, 178, 180, 185, 186, 194, 199, 205, 208, 211, 214-216, 219, 222, 226, 232, 236, 240, 241, 245, 246, 252-268, 320-324, 342, 353, 366-368, 377, 382, 385, 389, 395, 397, 400, 408, 411, 413, 414, 416, 417, 419-423, 426, 427, 429, 431, 435-438, 441, 443-446, 450, 453, 454 and 463-468 under moderately stringent conditions; and

(c) a complement of a sequence of (a) or (b).

2. An isolated polypeptide according to claim 1, wherein the polypeptide comprises an amino acid sequence that is encoded by a polynucleotide sequence recited in any one of SEQ ID NOS: 2, 4-15, 18-33, 35-47, 49-56, 58, 59, 63-73, 88-116, 141-159, 175, 178, 180, 185, 186, 194, 199, 205, 208, 211, 214-216, 219, 222, 226, 232, 236, 240, 241, 245, 246, 252-268, 320-324, 342, 353, 366-368, 377, 382, 385, 389, 395, 397, 400, 408, 411, 413, 414, 416, 417, 419-423, 426, 427, 429, 431, 435-438, 441, 443-446, 450, 453, 454 and 463-468 or a complement of any of the foregoing polynucleotide sequences.

3. An isolated polypeptide comprising a sequence recited in any one of SEQ ID NO: 176, 179, 181 and 469-473.

4. An isolated polynucleotide encoding at least 15 contiguous amino acid residues of a breast tumor protein, or a variant thereof that differs in one or more substitutions, deletions, additions and/or insertions such that the ability of the variant to react with antigen-specific antisera is not substantially diminished, wherein the tumor protein comprises an amino acid sequence that is encoded by a polynucleotide comprising a sequence recited in any one of SEQ ID NOS: 2, 4-15, 18-33, 35-47, 49-56, 58, 59, 63-73, 88-116, 141-159, 175, 178, 180, 185, 186, 194, 199, 205, 208, 211, 214-216, 219, 222, 226, 232, 236, 240, 241, 245, 246, 252-268, 320-324, 342, 353, 366-368, 377, 382, 385, 389, 395, 397, 400, 408, 411, 413, 414, 416, 417, 419-423, 426, 427, 429, 431, 435-438, 441, 443-446, 450, 453, 454 and 463-468 or a complement of any of the foregoing sequences.

5. An isolated polynucleotide encoding a breast tumor protein, or a variant thereof, wherein the tumor protein comprises an amino acid sequence that is encoded by a polynucleotide comprising a sequence recited in any one of SEQ ID NOS: 2, 4-15, 18-33, 35-47, 49-56, 58, 59, 63-73, 88-116, 141-159, 175, 178, 180, 185, 186, 194, 199, 205, 208, 211, 214-216, 219, 222, 226, 232, 236, 240, 241, 245, 246, 252-268, 320-324, 342, 353, 366-368, 377, 382, 385, 389, 395, 397, 400, 408, 411, 413, 414, 416, 417, 419-423, 426, 427, 429, 431, 435-438, 441, 443-446, 450, 453, 454 and 463-468 or a complement of any of the foregoing sequences.

6. An isolated polynucleotide comprising a sequence recited in any one of SEQ ID NOS: 2, 4-15, 18-33, 35-47, 49-56, 58, 59, 63-73, 88-116, 141-159, 175, 178, 180, 185, 186, 194, 199, 205, 208, 211, 214-216, 219, 222, 226, 232, 236, 240, 241, 245, 246, 252-268, 320-324, 342, 353, 366-368, 377, 382, 385, 389, 395, 397, 400, 408, 411, 413, 414, 416, 417, 419-423, 426, 427, 429, 431, 435-438, 441, 443-446, 450, 453, 454 and 463-468.

7. An isolated polynucleotide comprising a sequence that hybridizes to a sequence recited in any one of SEQ ID NOS: 2, 4-15, 18-33, 35-47, 49-56, 58, 59, 63-73, 88-116, 141-159, 175, 178, 180, 185, 186, 194, 199, 205, 208, 211, 214-216, 219,

222, 226, 232, 236, 240, 241, 245, 246, 252-268, 320-324, 342, 353, 366-368, 377, 382, 385, 389, 395, 397, 400, 408, 411, 413, 414, 416, 417, 419-423, 426, 427, 429, 431, 435-438, 441, 443-446, 450, 453, 454 and 463-468 under moderately stringent conditions.

8. An isolated polynucleotide complementary to a polynucleotide according to any one of claims 4-7.

9. An expression vector comprising a polynucleotide according to any one of claims claim 4-7.

10. A host cell transformed or transfected with an expression vector according to claim 9.

11. An expression vector comprising a polynucleotide according claim 8.

12. A host cell transformed or transfected with an expression vector according to claim 11.

13. A pharmaceutical composition comprising a polypeptide according to claim 1, in combination with a physiologically acceptable carrier.

14. A vaccine comprising a polypeptide according to claim 1, in combination with an immunostimulant.

15. A vaccine according to claim 14, wherein the immunostimulant is an adjuvant.

16. A vaccine according to claim 14, wherein the immunostimulant induces a predominantly Type I response.

17. A pharmaceutical composition comprising a polynucleotide according to claim 4, in combination with a physiologically acceptable carrier.

18. A vaccine comprising a polynucleotide according to claim 4, in combination with an immunostimulant.

19. A vaccine according to claim 18, wherein the immunostimulant is an adjuvant.

20. A vaccine according to claim 18, wherein the immunostimulant induces a predominantly Type I response.

21. An isolated antibody, or antigen-binding fragment thereof, that specifically binds to a breast tumor protein that comprises an amino acid sequence that is encoded by a polynucleotide sequence recited in any one of SEQ ID NOS: 2, 4-15, 18-33, 35-47, 49-56, 58, 59, 63-73, 88-116, 141-159, 175, 178, 180, 185, 186, 194, 199, 205, 208, 211, 214-216, 219, 222, 226, 232, 236, 240, 241, 245, 246, 252-268, 320-324, 342, 353, 366-368, 377, 382, 385, 389, 395, 397, 400, 408, 411, 413, 414, 416, 417, 419-423, 426, 427, 429, 431, 435-438, 441, 443-446, 450, 453, 454 and 463-468 or a complement of any of the foregoing polynucleotide sequences.

22. A pharmaceutical composition comprising an antibody or fragment thereof according to claim 18, in combination with a physiologically acceptable carrier.

23. A pharmaceutical composition comprising an antigen-presenting cell that expresses a polypeptide according to claim 1, in combination with a pharmaceutically acceptable carrier or excipient.

24. A pharmaceutical composition according to claim 23, wherein the antigen presenting cell is a dendritic cell or a macrophage.

25. A vaccine comprising an antigen-presenting cell that expresses a polypeptide according to claim 1, in combination with an immunostimulant.

26. A vaccine according to claim 25, wherein the immunostimulant is an adjuvant.

27. A vaccine according to claim 25, wherein the immunostimulant induces a predominantly Type I response.

28. A vaccine according to claim 25, wherein the antigen-presenting cell is a dendritic cell.

29. A method for inhibiting the development of a cancer in a patient, comprising administering to a patient an effective amount of a polypeptide according to claim 1, and thereby inhibiting the development of a cancer in the patient.

30. A method for inhibiting the development of a cancer in a patient, comprising administering to a patient an effective amount of a polynucleotide according to claim 4, and thereby inhibiting the development of a cancer in the patient.

31. A method for inhibiting the development of a cancer in a patient, comprising administering to a patient an effective amount of an antibody or antigen-binding fragment thereof according to claim 21, and thereby inhibiting the development

of a cancer in the patient.

32. A method for inhibiting the development of a cancer in a patient, comprising administering to a patient an effective amount of an antigen-presenting cell that expresses a polypeptide according to claim 1, and thereby inhibiting the development of a cancer in the patient.

33. A method according to claim 32, wherein the antigen-presenting cell is a dendritic cell.

34. A method according to any one of claims 29-32, wherein the cancer is breast cancer .

35. A fusion protein comprising at least one polypeptide according to claim 1.

36. A fusion protein according to claim 35, wherein the fusion protein comprises an expression enhancer that increases expression of the fusion protein in a host cell transfected with a polynucleotide encoding the fusion protein.

37. A fusion protein according to claim 35, wherein the fusion protein comprises a T helper epitope that is not present within the polypeptide of claim 1.

38. A fusion protein according to claim 35, wherein the fusion protein comprises an affinity tag.

39. An isolated polynucleotide encoding a fusion protein according to claim 35.

40. A pharmaceutical composition comprising a fusion protein according to claim 32, in combination with a physiologically acceptable carrier.

41. A vaccine comprising a fusion protein according to claim 35, in combination with an immunostimulant.

42. A vaccine according to claim 41, wherein the immunostimulant is an adjuvant.

43. A vaccine according to claim 41, wherein the immunostimulant induces a predominantly Type I response.

44. A pharmaceutical composition comprising a polynucleotide according to claim 40, in combination with a physiologically acceptable carrier.

45. A vaccine comprising a polynucleotide according to claim 40, in combination with an immunostimulant.

46. A vaccine according to claim 45, wherein the immunostimulant is an adjuvant.

47. A vaccine according to claim 45, wherein the immunostimulant induces a predominantly Type I response.

48. A method for inhibiting the development of a cancer in a patient, comprising administering to a patient an effective amount of a pharmaceutical composition according to claim 40 or claim 44.

49. A method for inhibiting the development of a cancer in a patient, comprising administering to a patient an effective amount of a vaccine according to claim 41 or claim 45.

50. A method for removing tumor cells from a biological sample, comprising contacting a biological sample with T cells that specifically react with a breast tumor protein, wherein the tumor protein comprises an amino acid sequence that is encoded by a polynucleotide sequence selected from the group consisting of:

- (i) polynucleotides recited in any one of SEQ ID NOS: 1-175, 178, 180 and 182-468; and
- (ii) complements of the foregoing polynucleotides;

wherein the step of contacting is performed under conditions and for a time sufficient to permit the removal of cells expressing the antigen from the sample.

51. A method according to claim 50, wherein the biological sample is blood or a fraction thereof.

52. A method for inhibiting the development of a cancer in a patient, comprising administering to a patient a biological sample treated according to the method of claim 50.

53. A method for stimulating and/or expanding T cells specific for a breast tumor protein, comprising contacting T cells with one or more of:

- (i) a polypeptide according to claim 1;
- (ii) a polynucleotide encoding such a polypeptide; and/or
- (iii) an antigen presenting cell that expresses such a polypeptide;

under conditions and for a time sufficient to permit the stimulation and/or expansion of T cells.

54. An isolated T cell population, comprising T cells prepared according to the method of claim 53.

55. A method for inhibiting the development of a cancer in a patient, comprising administering to a patient an effective amount of a T cell population according to claim 54.

56. A method for inhibiting the development of a cancer in a patient, comprising the steps of:

(a) incubating CD4⁺ and/or CD8⁺ T cells isolated from a patient with at least one component selected from the group consisting of:

- (i) a polypeptide according to claim 1;
- (ii) a polynucleotide encoding such a polypeptide; or
- (iii) an antigen-presenting cell that expresses such a

polypeptide;

such that T cells proliferate; and

(b) administering to the patient an effective amount of the proliferated T cells, and thereby inhibiting the development of a cancer in the patient.

57. A method for inhibiting the development of a cancer in a patient, comprising the steps of:

(a) incubating CD4⁺ and/or CD8⁺ T cells isolated from a patient with at least one component selected from the group consisting of:

- (i) a polypeptide according to claim 1;
- (ii) a polynucleotide encoding such a polypeptide; or
- (iii) an antigen-presenting cell that expresses such a

polypeptide;

such that T cells proliferate;

(b) cloning at least one proliferated cell; and

(c) administering to the patient an effective amount of the cloned T cells, and thereby inhibiting the development of a cancer in the patient.

58. A method for determining the presence or absence of a cancer in a patient, comprising the steps of:

(a) contacting a biological sample obtained from a patient with a binding agent that binds to a breast tumor protein, wherein the tumor protein comprises an amino acid sequence that is encoded by a polynucleotide sequence selected from the group consisting of:

(i) polynucleotides recited in any one of SEQ ID NOS: 1-175, 178, 180 and 182-468; and

(ii) complements of the foregoing polynucleotides;

(b) detecting in the sample an amount of polypeptide that binds to the binding agent; and

(c) comparing the amount of polypeptide to a predetermined cut-off value, and therefrom determining the presence or absence of a cancer in the patient.

59. A method according to claim 58, wherein the binding agent is an antibody.

60. A method according to claim 59, wherein the antibody is a monoclonal antibody.

61. A method according to claim 58, wherein the cancer is breast cancer.

62. A method for monitoring the progression of a cancer in a patient, comprising the steps of:

(a) contacting a biological sample obtained from a patient at a first point in time with a binding agent that binds to a breast tumor protein, wherein the tumor protein comprises an amino acid sequence that is encoded by a polynucleotide sequence recited in any one of SEQ ID NOS: 1-175, 178, 180 and 182-468 or a complement of any of the foregoing polynucleotides;

(b) detecting in the sample an amount of polypeptide that binds to the binding agent;

(c) repeating steps (a) and (b) using a biological sample obtained from

the patient at a subsequent point in time; and

(d) comparing the amount of polypeptide detected in step (c) to the amount detected in step (b) and therefrom monitoring the progression of the cancer in the patient.

63. A method according to claim 62, wherein the binding agent is an antibody.

64. A method according to claim 63, wherein the antibody is a monoclonal antibody.

65. A method according to claim 62, wherein the cancer is a breast cancer.

66. A method for determining the presence or absence of a cancer in a patient, comprising the steps of:

(a) contacting a biological sample obtained from a patient with an oligonucleotide that hybridizes to a polynucleotide that encodes a breast tumor protein, wherein the tumor protein comprises an amino acid sequence that is encoded by a polynucleotide sequence recited in any one of SEQ ID NOS: 1-175, 178, 180 and 182-468 or a complement of any of the foregoing polynucleotides;

(b) detecting in the sample an amount of a polynucleotide that hybridizes to the oligonucleotide; and

(c) comparing the amount of polynucleotide that hybridizes to the oligonucleotide to a predetermined cut-off value, and therefrom determining the presence or absence of a cancer in the patient.

67. A method according to claim 66, wherein the amount of polynucleotide that hybridizes to the oligonucleotide is determined using a polymerase chain reaction.

68. A method according to claim 66, wherein the amount of polynucleotide that hybridizes to the oligonucleotide is determined using a hybridization assay.

69. A method for monitoring the progression of a cancer in a patient, comprising the steps of:

(a) contacting a biological sample obtained from a patient with an oligonucleotide that hybridizes to a polynucleotide that encodes a breast tumor protein, wherein the tumor protein comprises an amino acid sequence that is encoded by a polynucleotide sequence recited in any one of SEQ ID NOS: 1-175, 178, 180 and 182-468 or a complement of any of the foregoing polynucleotides;

(b) detecting in the sample an amount of a polynucleotide that hybridizes to the oligonucleotide;

(c) repeating steps (a) and (b) using a biological sample obtained from the patient at a subsequent point in time; and

(d) comparing the amount of polynucleotide detected in step (c) to the amount detected in step (b) and therefrom monitoring the progression of the cancer in the patient.

70. A method according to claim 69, wherein the amount of polynucleotide that hybridizes to the oligonucleotide is determined using a polymerase chain reaction.

71. A method according to claim 69, wherein the amount of polynucleotide that hybridizes to the oligonucleotide is determined using a hybridization assay.

72. A diagnostic kit, comprising:

- (a) one or more antibodies according to claim 21; and
- (b) a detection reagent comprising a reporter group.

73. A kit according to claim 72, wherein the antibodies are immobilized on a solid support.

74. A kit according to claim 73, wherein the solid support comprises nitrocellulose, latex or a plastic material.

75. A kit according to claim 72, wherein the detection reagent comprises an anti-immunoglobulin, protein G, protein A or lectin.

76. A kit according to claim 72, wherein the reporter group is selected from the group consisting of radioisotopes, fluorescent groups, luminescent groups, enzymes, biotin and dye particles.

77. An oligonucleotide comprising 10 to 40 contiguous nucleotides that hybridize under moderately stringent conditions to a polynucleotide that encodes a breast tumor protein, wherein the tumor protein comprises an amino acid sequence that is encoded by a polynucleotide sequence recited in any one of SEQ ID NOS: 2, 4-15, 18-33, 35-47, 49-56, 58, 59, 63-73, 88-116, 141-159, 175, 178, 180, 185, 186, 194, 199, 205, 208, 211, 214-216, 219, 222, 226, 232, 236, 240, 241, 245, 246, 252-268, 320-324, 342, 353, 366-368, 377, 382, 385, 389, 395, 397, 400, 408, 411, 413, 414, 416, 417, 419-423, 426, 427, 429, 431, 435-438, 441, 443-446, 450, 453, 454 and 463-468 or a complement of any of the foregoing polynucleotides.

78. A oligonucleotide according to claim 77, wherein the oligonucleotide comprises 10-40 contiguous nucleotides recited in any one of SEQ ID NOS: 2, 4-15, 18-33, 35-47, 49-56, 58, 59, 63-73, 88-116, 141-159, 175, 178, 180, 185, 186, 194, 199, 205, 208, 211, 214-216, 219, 222, 226, 232, 236, 240, 241, 245, 246, 252-268, 320-324, 342, 353, 366-368, 377, 382, 385, 389, 395, 397, 400, 408, 411, 413, 414, 416, 417, 419-423, 426, 427, 429, 431, 435-438, 441, 443-446, 450, 453, 454 and 463-468.

79. A diagnostic kit, comprising:

- (a) an oligonucleotide according to claim 77; and
- (b) a diagnostic reagent for use in a polymerase chain reaction or hybridization assay.

SEQUENCE LISTING

<110> Corixa Corporation
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Mitcham, Jennifer L.
Xu, Jiangchun
Harlocker, Susan L.

<120> COMPOSITIONS FOR THE TREATMENT AND
DIAGNOSIS OF BREAST CANCER AND METHODS FOR THEIR USE

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aatcagtcac tcacatctgt gaaaagagtg ctagtataaa caaatgagat cacaaatttg    60
accattttat tagacaccct ctattagtgt taacagacaa agatgaaggt taagttgaaa    120
tcaaattgaa atcatcttcc ctctgtacag attgcaatat ctgataatac cctcaacttt    180
cttggtgcaa attaattgcc tgggtactcac agtccagtggt taacaggcaa taatggtgtg    240
attccagagg agaggactag gtggcaggaa aataaatgag attagcagta tttgacttgg    300
a                                                                 301

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<210> 28

<211> 286

<212> DNA

<213> Homo sapien

<400> 28

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tttttttttg cacaggatgc acttattcta ttcattctcc cccacccttc ccatatttac    60
atccttagag gaagagaggg gtaaggatgat aaagtaactg aaggaccgca agacgggtat    120
gtcccttggt caccaaatgg tcaaagggtc aaagatcgga ggaggctcagg gggtaacgca    180
ggaacagggt agggcggttc gccctctctc cctctccctt tttcaacctc ttaatcactg    240
gctaactcgc gacctcatgg gtttaattcgt aagcttacac gcgttg                    286

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<210> 29

<211> 301

<212> DNA

<213> Homo sapien

<400> 29

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gtcatgttct tgctcttctt tctttacaca tttgagttgt gccttctgtt cttaaagaga    60

```

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ttttcctttg ttcaaaggat ttattcctac catttcacaa atccgaaaat aattgaggaa 120
acagggttaca tcattccaat ttgtccttgg gtttgaagag tctctcatgg tggcacagtc 180
ctccagggtta gctatgttgt tgggtcccc tacatcccag aagctcagag actttgtcaa 240
aggtgtgccg tccacccatt gccactgacc ctcgacaacc tggctctgaca gtccaataaa 300
a 301

```

```

<210> 30
<211> 332
<212> DNA
<213> Homo sapien

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<400> 30
gagcagaatt gatgcctatg gctccaagtc aaatactgct aatctcattt attttcctgc 60
cacctagtcc tctcctctgg aatcacacca ttattgcctg ttaacactgg actgtgagta 120
ccaggcaatt aatttgcacc aagaaagttg aggggtattat cagatattgc aatctgtaca 180
gaggggaagat gatttcaatt tgatttcaac ttaaccttca tctttgtctg ttaacactaa 240
tagaggggtgt ctaataaaaat ggtcaaattt gtgatctcat ttgttataac tagcactctt 300
ttcacagatg tgatgactga tttccagcag ac 332

```

```

<210> 31
<211> 141
<212> DNA
<213> Homo sapien

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```

<400> 31
aaaggctatc aagtactttg aaggacagga aggaatgaac acaccaggt ggacgtttgg 60
tttcatttgc aggggttcag ggagggttgc aggggttcag ggagggtctt tgtcccacaa 120
ccgggggaag ggagagggga c 141

```

```

<210> 32
<211> 201
<212> DNA
<213> Homo sapien

```

```

<400> 32
gagctgatct cacagcacat acagaatgat gctactatgt agaccctcac tcccttggga 60
aatctgtcat ctaccttaaa gagagaaaaa agatggaaca tagggccacc tagtttcac 120
catccaccta cataaccaac atagatgtga ggtccactgc actgatagcc agactgcctg 180
gggtaaacct tttcagggag g 201

```

```

<210> 33
<211> 181
<212> DNA
<213> Homo sapien

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```

<400> 33
tttcaaaaaca ctcatatgtt gcaaaaaaca catagaaaaa taaagtttgg tgggggtgct 60
gactaaactt caagtcacag acttttatgt gacagattgg agcaggggtt gttatgcatg 120
tagagaaccc aaactaattt attaaacag agagaaacag gctgtctggg tgaaatgggt 180
c 181

```

```

<210> 34
<211> 151
<212> DNA
<213> Homo sapien

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<400> 34

atgtccctgca cagtatagct tggacctctg ggcctgaacc aggggtgagca tcaaggcccc	60
catttctcct caccacgggg tcgcttgca gctccaagaa ccagtctggc cccactgaga	120
acttttcagt cgagggcctg atgaatcttg g	151

<210> 35

<211> 291

<212> DNA

<213> Homo sapien

<400> 35

tctttagggc aaaatcatgt ttctgtgtac ctagcaatgt gttcccatTT tattaagaaa	60
agctttaaca cgtgtaatct gcagtcctta acagtggcgt aattgtacgt acctgttgtg	120
tttcagtttg tttttcacct ataatgaatt gtaaaaacaa acatacttgt ggggtctgat	180
agcaaacata gaaatgatgt atattgtttt ttgttatcta tttattttca tcaatacagt	240
atTTtgatgt attgcaaaaa tagataataa tttatataac aggttttctg t	291

<210> 36

<211> 201

<212> DNA

<213> Homo sapien

<400> 36

ctgatacaat tataataacg gttccctgaa ccttttagag tgcaattaag aacaaaaact	60
aaattttgtt tacatgaata tggataaat acaataatca aaatatgact ctccctaaaa	120
gtgaaacaca caagccaatc cggaactgct gtgcgaaaga taaaatcgag aaaggcaagg	180
tttcggtagg aggacgcgat g	201

<210> 37

<211> 121

<212> DNA

<213> Homo sapien

<400> 37

catcacactg gcgccgctc gagcatgcat ctagagggcc caattcgccc tataatgagt	60
cgtattacaa ttcactggcc gtcgttttac aacgtcgtga ctgggaaaac cctggcgcta	120
c	121

<210> 38

<211> 200

<212> DNA

<213> Homo sapien

<400> 38

aaacatgtat tactctatat ccccaagtcc tagagcatga cctgcatgtt ggagatgttg	60
tacagcaatg tatttatcca gacatacata tatgatattt agagacacag tgattctttt	120
gataacacca cacatagaac attataatta cacacaaatt tatggtaaaa gaattaatat	180
gctgtctggt gctgctgtta	200

<210> 39

<211> 760

<212> DNA

<213> Homo sapien

<400> 39

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gcgtgggtcgt cggccgaggt cctgggctag acctaagtgt ttattattgg tggagagaaa      60
gatctggaaa tacttgaggt tattacatac tagattagct tctaagtga accatttttc      120
ttttaacagt gatcaaatta ttatttcgaa gttaatcgtt cccttgggtg ctgcatacac      180
atcgcattaa caaacatact gttgtatttt ttcccagttt tgtttggcta tggcaccaca      240
gtcatcccca gggctctatac atactatgtt tcaactgtat tatttgccat ttttggcatt      300
agaatgcttc ggggaaggctt aaagatgagc cctgatgagg gtcaagagga actggaagaa      360
gttcaagctg aattaaagaa gaaagatgaa gaagtaagcc atggcactgt tgatctggac      420
caaaaaggca ctcaactagg aataaacact ctacagaggt ttctcagtgg ccccatctgt      480
gtgatatgcg gggctacaca aaaatagctt cttttgcttt gttctgttct tatacctgtc      540
tgtgatctga cttgggggtg gtgtgaatgt agtagagaaa ggaagctgac agatgaatac      600
tgaacacagg taatcagttt ccttaattag gttgattata agctcctgaa aagcaggaac      660
tgtattttat aattttacct gtttctcccg tgggtgtctag gatagtaagt gagcagagca      720
gtaaatactg tttggtttgt tcagacctgc ccgggcggcc      760

```

<210> 40

<211> 452

<212> DNA

<213> Homo sapien

<400> 40

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aatcactaaa gatattgact agagaatgct gtgtgctatt tcaattacat ttgtttttct      60
tttattaaca ggaattttga ttcttcaagg aagtggctca atttcaattt caggtgacca      120
ggtttatcgt gacttttctt tcttggttac ttttcgctag gaaggggagt tgtaggggca      180
gattcaggta ttggaatagg aaaattacgt ctaaaccatg gaaatcttgg aaatggaatt      240
ggtggaagtg ggcgaaatgg atatgggtaa gggaacacaa aaaaccctga agctaattca      300
tcgctgtcac tgatacttct ttttctctgt tcctggctct gagagactgg gaaaccaaca      360
gccactgcca agatggctgt gatcaggagg agaactttct tcactcaca cgtttcagtc      420
agttctttct ctacacctcg ccgcgaccac gc      452

```

<210> 41

<211> 676

<212> DNA

<213> Homo sapien

<400> 41

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aatctttgaa tgccaagtct cttctgtact ttcttttatt aacatcatag tctttgcac      60
aagatacata gcaatgatag caggtttctt tttaaagctt agtattaata ttaaataatt      120
ttccccattt aaattttaca ttacttgcca agaaaaaaaa aaaattaaaa ctcaagttac      180
ttgaagcctg gacacacttc catgattagc cgggctaggt aaaagttggt ggctttattc      240
ttcctgtctt ataagcagat ccaggcccta gaaagatggg accaggggat ataattgttt      300
ttgaaaagtg tgctacaaaa atggatggcc tgttataagc caggatacaa agttaaggat      360
gggggtaagg gagggacatt ttcttcaga agaaaagaca gaatttctga agagtccag      420
tccataattt tcccaaatg gttggaggag agggtaaaat ctcaacatga gtttcaaagt      480
actgtctctg tgaggggccc gtagatgcct tgctgaggag ggatggctaa tttggaccat      540
gccccatccc cagctaggag aatggaaatg gaaactttta ttgccagtg ggtgtgaaag      600
tgggctgaag cttggttggg actgaattct ctaagaggtt tcttctagaa acagacaact      660
cagacctgcc cgggccc      676

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<210> 42

<211> 468

<212> DNA

<213> Homo sapien

<400> 42

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agcgtgggtcg cggccgaggt ttggccggga gctgatcac ctgcccctgct gagtcccagg      60
ctgagccctca gtctccctcc cttggggcct atgcagaggt ccacaacaca cagatttgag      120
ctcagccctg  gtgggcagag aggtagggat ggggctgtgg ggatagttag gcatcgcaat      180
gtaagactcg  ggattagtac acacttgttg attaatggaa atgtttacag atccccaagc      240
ctggcaaggg  aatttcttca actccctgcc cccagccct ccttatcaaa ggacaccatt      300
ttggcaagct  ctatgaccaa ggagccaaac atcctacaag acacagttag catactaatt      360
aaaacccct  gcaaagccca gcttgaaacc ttcacttagg aacgtaatcg tgtcccctat      420
cctacttccc cttcctaatt ccacagacct gcccgggcgg ccgctcga      468

```

<210> 43
 <211> 408
 <212> DNA
 <213> Homo sapien

```

<400> 43
atcatatcaa aacactatct tcccatctgt ttctcaatgc ctgctacttc ttgtagatat      60
ttcattttcag gagagcagca gttaaaccgg tggattttgt agttaggaaac ctgggttcaa      120
acctctttcc actaattggc tatgtctctg gacagttttt tttttttttt ttttttttaa      180
accctttctg aacttttact ttctatggct acctcaaaga attgttgtga ggcttgagat      240
aatgcatttg taaagggctc gccagatagg aagatgctag ttatggattt acaaggttgt      300
taagggctgta agagtcctaaa acctacagtg aatcacaaatg catttaccct cactgacttg      360
gacataagtg aaaactagcc cgaagtctct ttttcaaatt acttacag      408

```

<210> 44
 <211> 160
 <212> DNA
 <213> Homo sapien

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<400> 44
tggtcgcggc cgaggtcttg tgtgccctgt ggtccagggg accaagaaca acaagatcca      60
ctctctgtgc tacaatgatt gcaccttctc acgcaacact ccaaccagga ctttcaacta      120
caacttctcc gctttggcaa acaccgtcac tcttgctgga      160

```

<210> 45
 <211> 231
 <212> DNA
 <213> Homo sapien

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<400> 45
cgagcgggcc cccgggcagg tctggggagg tgattccatc cagagtcata tctgttgtca      60
ccccaaataag tcgatcagca aggtgacag gctgtgagga aaccccggcc ttgtagcctg      120
tcacctctgg ggggatgatg actgcctggc agacgtaggc tgtgatagat ttgggagaaa      180
acctgactca ccctcaggaa tccggaggtc ggtgacattg tcggtgcaca c      231

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<210> 46
 <211> 371
 <212> DNA
 <213> Homo sapien

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<400> 46
cccgggcagg tctgtgtaac atgccaaggc ttctgacttt ctgcagagca gttttttatt      60
ttccttatca ggtacaggtt ttggtttttc ttgactatct ctgatgaatt ttcatgagt      120
ctgtatatgc agaattcttt ccctaaatac tgcttcgtcc catgtctgaa ggcgtaaaat      180
aaagtcatc atcatttttt ctttgtacat gtttatttgt tctttttcaa ttacaccaag      240
cattactagt cagaaggaag cacttgctac ctcttgctct tcctctgctt ctgggttggga      300

```

tcattttgat gacattgccc acattactca tgaaggatga caagattgca ctgtgcaatg 360
tcaattgccc t 371

<210> 47
<211> 261
<212> DNA
<213> Homo sapien

<400> 47
gccctgtttt tatacacttc acatttgcag aaatataatg atgccctcat tatcagtgag 60
catgcacgaa tgaaagatgc tctggattac ttgaaagact tcttcagcaa tgtccgagca 120
gcaggattcg atgagattga gcaagatcct actcagagat ttgaagaaaa gctgcaggaa 180
ctagaaagtg tttccaggga tcccagcaat gagaatccta aacttgaaga cctctgcttc 240
atcttacaag aagagtacca c 261

<210> 48
<211> 701
<212> DNA
<213> Homo sapien

<400> 48
cgagcggccc cggggcaggc ccaattagta caagtctcat gatataatca ctgcctgcat 60
acatatgcac agatccagtt agtgagtttg tcaagcttaa tctaattggg taagtctcaa 120
agagattatt attcttgatg tttgctttgt attggctaac aaatgtgcag aggtaataca 180
tatgtgatgt ccgatgtctc tgtctttttt tttgtcttta aaaaataatt ggcagcaact 240
gtatttgaat aaaatgattt cttagtatga ttgtaccgta atgaatgaaa gtggaacatg 300
tttctttttg aaagggagag aattgaccat ttattattgt gatgtttaag ttataactta 360
ttgagcactt ttagtagtga taactgtttt taaacttgcc taataccttt cttgggtatt 420
gtttgtaatg tgacttattt aacccccctt tttgtttgtt taagttgctg ctttaggtta 480
acagcgtggt ttagaagatt taaatttttt tctgtctgca acaattagtt attcagagca 540
agagggcctg attttataga agccccctga aaagagggtc agatgagagc agagatacag 600
tgagaaatta tgtgatctgt gtgttgtggg aagagaattt tcaatatgta actacggagc 660
tgtagtgcca ttagaaaactg tgaatttcca aataaatttg a 701

<210> 49
<211> 270
<212> DNA
<213> Homo sapien

<400> 49
agcggccgcc cgggcaggct tgatattagt agctttgcaa ccctgataga gtaaataaat 60
tttatgggag ggtgccaaat actgctgtga atctatttgt atagtatcca tgaatgaatt 120
tatggaaata gatatttgtg cagctcaatt tatgcagaga ttaaatagaca tcataatact 180
ggatgaaaac ttgcatagaa ttctgattaa atagtgggtc tgtttcacat gtgcagtttg 240
aagtatttaa attaaccact cttttcacag 270

<210> 50
<211> 271
<212> DNA
<213> Homo sapien

<400> 50
atgcatttat ccatatgaac ttgattattc tgaattactg actataaaaa ggctattgtg 60
aaagatatca cactttgaaa cagcaaatga attttcaatt ttacatttaa ttataagacc 120
acaataaaaa gttgaacatg cgcatactta tgcatttcac agaagattag taaaactgat 180

ggcaacttca gaattatttc atgaagggtg caaacagtct ttaccacaat tttcccatgg 240
tcttatcctt caaaataaaaa ttccacacac t 271

<210> 51
<211> 241
<212> DNA
<213> Homo sapien

<400> 51
tggtcgcggc cgaggtgtga ggagatgaac tttgtgttaa tggggggcac tttaaatcga 60
aatggcttat cccacccgcc atgtaagtta ccatgcctgt ctctccctc ctacacattt 120
ccagctcctg ctgcagttat tctacagaa gctgccattt accagccctc tgtgattttg 180
aatccacgag cactgcaggc cctccacagc gttactacc agcaggcact cagctcttca 240
t 241

<210> 52
<211> 271
<212> DNA
<213> Homo sapien

<400> 52
tccaagactt aaaacttagg aaacacctat gatgccactt taactggaag taatggagac 60
atctgattcc aaattcacat tttaaatgcc tatttgcaat cagcaaagag ccaggtatgc 120
tgcatgctgc ttgctgtaag ttacgatttg gcttcaactag ctcaaatttt ttcactccac 180
caaaaataaa ggcacaggcc cgtttgcca atcaagtttg ctgaaaatac tgcagcctga 240
gtgtagacaa acttccctg aatttgctag a 271

<210> 53
<211> 493
<212> DNA
<213> Homo sapien

<400> 53
ttagcgtggc cgcggtccga ggtctggcct gactagctca ctctgaagag tgtctttcac 60
atggattaac caaaaaatgc attactgcct ttggcacact gtcttgaata tttttctga 120
caatgagaaa atatgattta atggagtcgt tcaataacct cacaatctcg ctgttccgag 180
cagatagttt tctgccaac aggaactggc acatctagca gggtcacggc atgacctttt 240
tgtggactgg ctggcataat tggaaatggg tttgattttt ctctctgctaa taactcttca 300
agcttttgaa gttttcaagc attcctctcc agttgcctgt ggttggttct tgaacaccat 360
ctccaacccc accacctcca gatgcaacct tgtctcgtga tacagacctg cccggggcggc 420
cctcaagggc gaattctgca gatatccatc acactggcgg ccgctcgagc atgcatctag 480
agggcccaat tgc 493

<210> 54
<211> 321
<212> DNA
<213> Homo sapien

<400> 54
cgtggtcgcg gccgaggtct gtttgcctgt tgggtgtgagt ttttctctg gagactttgt 60
actgaatgtc aataaactct gtgattttgt taggaagtaa aactgggac tatttagcca 120
ctggaagct tctgaggtga aggattcagg gacatctcgt ggaacaaaca ctccccactg 180
gactttctct ctggagatac ctttttgaat atacaatggc cttggctcac taggtttaaa 240
tacaaacaag tctgaaaccc actgaagact gagagattgc agcaatattc tctgaattag 300
gatcgggttc cataactcta a 321

<210> 55
 <211> 281
 <212> DNA
 <213> Homo sapien

<400> 55
 ttgcaaataa aactgtggat gtataataag aaaacacaag gggtttattct taacactaaa 60
 attaacatgc cacacgaaga ctgcattaca gctctctgtt tctgtaatgc agaaaaatct 120
 gaacagccca ccttggttac agctagcaaa gatgggtact tcaaagtatg gatattaaca 180
 gatgactctg acatatacaa aaaagctgtt ggctggacct gtgactttgt tggtagttat 240
 cacaagtatc aagcaactaa ctgttgtttc tccgaagatg g 281

<210> 56
 <211> 612
 <212> DNA
 <213> Homo sapien

<400> 56
 gcgtgggtcgc ggccgaggtc ctgtccgggg gcactgagaa ctccctctgg aattcttggg 60
 ggggtgttggg gagagactgt gggcctggag ataaaaactg tctcctctac caccaccctg 120
 taccctagcc tgcacctgtc ctcatctctg caaagttcag ctcccttccc cagggtctctg 180
 tgccactctg tcttgatgc tctggggagc tcatgggtgg aggagtctcc accagagggg 240
 ggctcagggg actggttggg ccagggatga atatttgagg gataaaaaatt gtgtaagagc 300
 caaagaattg gtagtagggg gagaacagag aggagctggg ctatgggaaa tgatttgaat 360
 aatggagctg ggaatatggc tggatatctg gtactaaaaa agggctctta agaacctact 420
 tcctaattctc ttccccaatc caaacctatg ctgtctgtcc agtgctctct tcctgcctcc 480
 agctctgccc caggctcctc ctgactctg tccctgggct agggcagggg aggagggaga 540
 gcaggggttg gggagaggct gaggagagtg tgacatgtgg ggagaggacc agacctgccc 600
 gggcggccgt cg 612

<210> 57
 <211> 363
 <212> DNA
 <213> Homo sapien

<400> 57
 gtgcgggctg aggtcctgag cgtcacccta gttctgcccc tttttagctg tgtagacttg 60
 gacaagacat ttgacttccc tttctccttg tctataaaat gtggacagtg gacgtctgtc 120
 acccaagaga gttgtgggag acaagatcac agctatgagc acctcgcacg gtgtccagga 180
 tgcacagcac aatccatgat gcgtttttct cccttacgca ctttgaaacc catgctagaa 240
 aagtgaatac atctgactgt gctccactcc aacctccagc gtggatgtcc ctgtctgggc 300
 cctttttctg tttttttattc tatgttcagc accactggca ccaaatacat ttttaattcac 360
 cga 363

<210> 58
 <211> 750
 <212> DNA
 <213> Homo sapien

<400> 58
 cgtggctcgc gccgaggtct aattccacct gactggcaga acctgcgccc ctgcgctaac 60
 ctgcgccctt ctcccaactc gcgtgcctca cagaacctcag gtgctgcaca gccccgagat 120
 gtggcccttc ttccaggaaa agcaaataag ttggtccaag tacttgatgc ttaaggaaata 180
 cacaaagggtg cccatcaagc gctcagaaat gctgagagat atcatccgtg aatacactga 240

tgtttatcca	gaaatcattg	aacgtgcatg	ctttgtccta	gagaagaaat	ttgggattca	300
actgaaagaa	attgacaaag	aagaacacct	gtatattctc	atcagtaccc	ccgagtccct	360
ggctggcata	ctgggaacga	ccaaagacac	acccaagctc	ggctctctct	tgggtattct	420
gggtgtcatc	ttcatgaatg	gcaaccgtgc	cagtggaggct	gtcttttggg	aggcactacg	480
caagatggga	ctgcgtcctg	gggtgagaca	tccctccct	tggagatcta	aggaaacttc	540
tcacctatga	gtttgtaaag	cagaaatacc	tggactacag	acgagtgcc	aacagcaacc	600
ccccggagta	tgagttcctc	tggggcctcc	gtccctacca	tgagactagc	aagatgaaaa	660
tgctgagatt	cattgcagag	gttcagaaaa	gagaccctcg	tgactggact	gcacagtcca	720
tggaggctgc	agatgaggac	ctgcccgggc				750

<210> 59
 <211> 505
 <212> DNA
 <213> Homo sapien

tgggcgcccg	ggcaggtcca	gtctacaagc	agagcactct	catggggagc	accagatgag	60
ttccagccgc	agtctcttta	taagctttaa	gtgcctcatg	aagacgcgag	gatctcttcc	120
aagtgcgaac	tggtcacatc	agggcacatt	cagcagcaga	agctctgttc	cagtatatgc	180
cttggtatgg	ctaaattcca	ctgtcccttt	ctcagcagtc	aataatccat	gataaattct	240
gtacaacact	gtagtcaata	acagcagcac	cagacagcat	attaattctt	ttaccataaa	300
tttgtgtgta	attataatgt	tctatgtgtg	gtgttatcaa	aagaatcact	gtgtctctaa	360
atatcatata	tgtatgtctg	gataaataca	ttgtgtgaca	acatctccaa	catgcaggtc	420
atgctctaag	acttggggat	atagagtaat	acatgtttcg	tggacctcgg	ccgcgaccac	480
gctaaggggc	aattctgcag	atatac				505

<210> 60
 <211> 520
 <212> DNA
 <213> Homo sapien

cgtggctcgc	gccaggtgcc	tcaggacaag	gaaacaggta	tcagcatgat	ggtagcagaa	60
accttatcac	caaggtgcag	gagctgactt	cttccaaaga	gttgtgggtc	cgggcagcgg	120
tcattgctcg	cccttgctgg	agggctgatt	ttagtgttgc	ttattatggt	ggccctgagg	180
atgcttcgaa	gtgaaaataa	gaggctgcag	gatcagcggc	aacagatgct	ctcccgtttg	240
cactacagct	ttcacggaca	ccattccaaa	aaggggcagg	ttgcaaagt	agacttggaa	300
tgcattgtgc	cggtcagtgg	gcacgagaac	tgctgtctga	cctgtgataa	aatgagacaa	360
gcagacctca	gcaacgataa	gatcctctcg	cttgttcaact	ggggcatgta	cagtgggcac	420
gggaagctgg	aattcgtatg	acggagctct	atctgaacta	cacttactga	acagcttgaa	480
ggacctgccc	gggcggccgc	tcgaaagggg	cgaattctgc			520

<210> 61
 <211> 447
 <212> DNA
 <213> Homo sapien

agagaggtgt	ttttattctt	tggggacaaa	gccgggttct	gtgggtgtag	gattctccag	60
gttctccagg	ctgtagggcc	cagaggctta	atcagaattt	tcagacaaaa	ctggaacctt	120
tcttttttcc	cgttggttta	tttgtagtcc	ttgggcaaac	caatgtcttt	gttcgaaaga	180
gggaaaataa	tccaaacgtt	tttcttttaa	cttttttttt	aggttcaggg	gcacatgtgt	240
aggcttgcta	tataggtaaa	ttgcatgtca	ccagggtttg	ttgtacagat	tatttcacca	300
tccagataaa	aagcatagta	ccagataggt	agttttttga	tcctcaccct	ccttccatgc	360
tccgacctca	ggtaggcccc	agtgtctgac	ctgcccggcg	gcccgcctga	aagggccaat	420

tctgcagata tccatcacac tggccgg

447

<210> 62
 <211> 83
 <212> PRT
 <213> Homo sapien

<400> 62
 Lys Lys Val Leu Leu Leu Ile Thr Ala Ile Leu Ala Val Ala Val Gly
 1 5 10 15
 Phe Pro Val Ser Gln Asp Gln Glu Arg Glu Lys Arg Ser Ile Ser Asp
 20 25 30
 Ser Asp Glu Leu Ala Ser Gly Phe Phe Val Phe Pro Tyr Pro Tyr Pro
 35 40 45
 Phe Arg Pro Leu Pro Pro Ile Pro Phe Pro Arg Phe Pro Trp Phe Arg
 50 55 60
 Arg Asn Phe Pro Ile Pro Ile Pro Ser Ala Pro Thr Thr Pro Leu Pro
 65 70 75 80
 Ser Glu Lys

<210> 63
 <211> 683
 <212> DNA
 <213> Homo sapien

<400> 63
 acaaagattg gtagcttttta tatttttttta aaaatgctat actaagagaa aaaacaaaag 60
 accacaacaa tattccaaat tataggttga gagaatgtga ctatgaagaa agtattctaa 120
 ccaactaaaa aaaatattga aaccactttt gattgaagca aaatgaataa tgctagattt 180
 aaaaacagtg tgaaatcaca ctttggtctg taaacatatt tagctttgct tttcattcag 240
 atgtatacat aaacttattt aaaatgtcat ttaagtgaac cattccaagg cataataaaa 300
 aaagwggtag caaatgaaaa ttaaagcatt tattttggta gttcttcaat aatgatrcga 360
 gaaactgaat tccatccagt agaagcatct cttttgggt aactgaaaca agtrccaacc 420
 cagatagcaa catccactaa tccagcacca attccttcac aaagtccttc cacagaagaa 480
 gtgcgatgaa tattaattgt tgaattcatt tcagggtctt cttggtccaa ataaattata 540
 gcttcaatgg gaagaggtcc tgaacattca gtcctattga atgtgaaata ccaacgctga 600
 cagcatgcat ttctgcattt tagccgaagt gagccactga acaaaactct tagagcacta 660
 tttgaacgca tctttgtaaa tgt 683

<210> 64
 <211> 749
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(749)
 <223> n = A,T,C or G

<400> 64
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 cctccgtgta aatgttttat gtgttcgcct actgatccca ttcgttgctt ctattgtaaa 120
 tatttgatcat ttgtatttat tatctctgtg ttttccccct aaggcataaa atggtttact 180
 gtgttcattt gaaccattt actgatctct gttgtatatt tttcatgccca ctgcttttgtt 240

ttctcctcag	aagtcgggta	gatagcattt	ctatcccatc	cctcacgtta	ttggaagcat	300
gcaacagtat	ttattgctca	gggtcttctg	cttaaaactg	aggaagggtc	acattcctgc	360
aagcattgat	tgagacattt	gcacaatcta	aaatgtaagc	aaagtaagtc	attaaaaata	420
cacctctac	ttgggcttta	tactgcatac	aaatttactc	atgagccttc	ctttgaggaa	480
ggatgtggat	ctccaaataa	agatttagtg	tttattttga	gctctgcata	ttancaagat	540
gatctgaaca	cctctccttt	gtatcaataa	atagccctgt	tattctgaag	tgagaggacc	600
aagtatagta	aaatgctgac	atctaaaact	aaataaatag	aaaacaccag	gccagaacta	660
tagtcatact	cacacaaagg	gagaaattta	aactcgaacc	aagcaaaagg	cttcacggaa	720
atagcatgga	aaaacaatgc	ttccagtgg				749

<210> 65

<211> 612

<212> DNA

<213> Homo sapien

<400> 65

acagcagcag	tagatggctg	caacaacctt	cctcctaccc	cagcccagaa	aatattttctg	60
ccccaccca	ggatccggga	ccaaaataaa	gagcaagcag	gcccccttca	ctgaggtgct	120
gggtagggtc	cagtgccaca	ttactgtgct	ttgagaaaga	ggaaggggat	ttgtttggca	180
ctttaaaaat	agaggagtaa	gcaggactgg	agaggccaga	gaagatacca	aaattggcag	240
ggagagacca	tttgccgcca	gtccccctagg	agatgggagg	agggagatag	gtatgagggt	300
aggcgctaag	aagagtagga	gggggtccact	ccaagtggca	gggtgctgaa	atgggctagg	360
accaacagga	cactgactct	aggtttatga	cctgtccata	cccgttccac	agcagctggg	420
tgggagaaaat	caccattttg	tgactttctaa	taaaataatg	ggtctaggca	acagttttca	480
atggatgcta	aaacgattag	gtgaaaagt	gatggagaat	tttaattcag	gggaattagg	540
ctgataccat	ctgaaaccat	ttggcatcat	taaaaatgtg	acaacctggg	ggctgccagg	600
gaggaagggg	ag					612

<210> 66

<211> 703

<212> DNA

<213> Homo sapien

<400> 66

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gcacagaacc	aagaattaca	gaaaaaagtc	caggagctgg	agaggcacaa	catctccttg	120
gtagctcagc	tccgccagct	gcagacgcta	attgctcaaa	cttccaacaa	agctgccccag	180
accagcactt	gtgttttgat	tcttcttttt	tccctggctc	tcatcctcct	gcccagcttc	240
agtccattcc	agagtcgacc	agaagctggg	tctgaggatt	accagcctca	cggagtgaact	300
tccagaaata	tctgaccca	caaggacgta	acagaaaatc	tggagaccca	agtggtagag	360
tccagactga	gggagccacc	tggagccaag	gatgcaaatg	gctcaacaag	gacactgctt	420
gagaagatgg	gaggggaagcc	aagacccagt	gggcgcatcc	ggtccgtgct	gcatgcagat	480
gagatgtgag	ctggaacaga	ccttcctggc	ccacttctctg	atcacaagga	atcctgggct	540
tccttatggc	tttgcttccc	actgggattc	ctacttaggt	gtctgccctc	aggggtccaa	600
atcacttcag	gacaccccaa	gagatgtcct	ttagtctctg	cctgaggcct	agtctgcatt	660
tgtttgcata	tatgagaggg	tacctgcccg	ggcggccgct	cga		703

<210> 67

<211> 1022

<212> DNA

<213> Homo sapien

<400> 67

cttgagaaaag	caggattgtt	ttaagttcca	agatttaaca	aacttactgt	tcagcatcat	60
attcaagcct	aaaaggaaga	taggattttc	aagatatatt	tccaacttct	ttaacatggc	120

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accatggatg aactgtttct cagcaactgtg ctgcttcact tgggaattaag gatgaattgg 180
gaggagacag tatgacatag gtgggtagggt tgggtgggtga ggggaaccag ttctaatagt 240
cctcaactcc actccagctg ttctgtttcc acacgggtcca ctgagctggc ccagtccctt 300
tcaactcagt tgcacacaaa ggcagcttca aggttcaatg gcaagagacc acctataacc 360
tcttcacctt ctgctgcctc ttctgtctgc cactgactgc catggccatc tgctatagcc 420
gcattgtcct cagtgtgtcc aggcccccaga caaggaaggg gagccatggg gagactccaa 480
ttcccaggcc ttaatcctta accctagacc tgttgccctc agcatcattt atttatctac 540
ctacctaata gctatctacc agtcattaaa ccattgggtgag attctaacca tgtctagcac 600
ctgatgctag agataatttt gttgaatccc ttcaattata aacagctgag tttagctggac 660
aaggactagg gaggcaatca gtattattta ttcttgaaca ccatcaagtc tagacttggg 720
ggcttcatat ttctatcata atccctgggg gtaagaaatc atatagcccc aggttggggaa 780
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attttctaaa ttccctagccc ctgctgggtga atttgccctc ccccgctcct ttgacaattg 960
tccccgtgtt cgtctccggg ccttgagact ggccctgctt atcttgctga ccttcatect 1020
ct 1022

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<210> 68
 <211> 449
 <212> DNA
 <213> Homo sapien

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<400> 68
ccagatccat ttctcagtgg ctggatttct ttttattttc ttttcaactt gaaagaaact 60
ggacattagg ccactatgtg ttgttactgc cactagtgtt caagtgcctc ttgttttccc 120
agagatttcc tgggtctgcc agaggcccag acaggctcac tcaagctctt taactgaaaa 180
gcaacaagcc actccaggac aaggttcaaa atgggtacaa cagcctctac ctgtcgcccc 240
agggagaaaag gggtagtgat acaagtctca tagccagaga tgggtttcca ctccctctag 300
atattcccaa aaagaggctg agacaggagg ttattttcaa ttttattttg gaattaaata 360
cttttttccc tttattactg ttgtagtccc tcacttggat atacctctgt tttcacgata 420
gaaataaggg aggtctagag cttctattc 449

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<210> 69
 <211> 387
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(387)
 <223> n = A,T,C or G

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<400> 69
gcccttagcg tgggtcgcg cncgangtct ggagcntatg tgatncctat ggtncncagg 60
cnnatactgc tantctcatt tattctcctg cnacctantc ctctnctctg gaatcacacc 120
attattgcct gttaacactg gactgtgagt accangcaat taatttgcac caanaaagtt 180
gaggggtatta tcanatattg caatctgtac agagggaaga tgatttcaat ttgatttcaa 240
cttaaccttc atctttgtct gttaacacta atagagggtg tctaataaaa tggcaaattt 300
gngatctcat tnggtataac tacactcttt ttcacagatg tgatgactga atttccanca 360
acctgccccg gcggnccgntc naagggc 387

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<210> 70
 <211> 836
 <212> DNA
 <213> Homo sapien

<400> 70

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tggagcttag	tgctactgaa	taccctggcc	acagagccac	ctcaggatat	tcttttctcc	120
accctagttt	atttatttat	agatatctgt	ttacaaagtc	tgtagttaat	cctgatgctg	180
accatctgaa	atgtactttt	tttctgaatg	ctgtttcaat	ctaaaatagc	agcttttgag	240
aaaacaatga	tgtaaattcc	ttatgataaa	aggatgattc	tatatattct	ttaatgatat	300
taaatatgcc	gaagccaagc	acacagctct	tctaaagtgt	gtgtatgttt	gtgtgaatgt	360
gaatgatact	gatcttatat	ctgttaaaag	ttgttttaaa	aagctgtggc	atcccattgt	420
tcataattgc	caagtcttct	gtaaagatgt	ctaggacgaa	atattttatg	tgctaattgca	480
tgtatttgta	aaccagattt	gtttaccact	caaaattaac	ttgttttctt	catccaaaaa	540
agtttatttc	ttccacgtac	ttaaattttc	tgtgtgggta	taatatagct	ttctaatttt	600
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gtataacacc	agagcttgct	gtttaaagga	ttatatgatg	tacatcagtt	ctataaatgt	720
gctcagcagt	ttaacatgtg	aatcctgttt	taaagtgtc	agatttcaac	tgtgtaagcc	780
attgatataa	cgctgtaatt	aaaaatgttt	atatgaaaaa	aaaaaaaaaa	aaaaaa	836

<210> 71

<211> 618

<212> DNA

<213> Homo sapien

<400> 71

gttgacagtga	gctcaagtgt	tgggtgtatc	agctcaaaac	accatgtgat	gccaatcatc	60
ttcacaggag	caatttggtt	accttttttt	tctgatgctt	tactaacttc	atcttttaga	120
tttaaatcat	tagtagatcc	tagaggagcc	agtttcagaa	aatatagatt	ctagttcagc	180
accacccgta	gttggtgcatt	gaaataatta	tcattatgat	tatgtatcag	agcttctggg	240
tttctcattc	tttattcatt	tattcaacaa	ccacgtgaca	aacactggaa	ttacaggatg	300
aagatgagat	aatccgctcc	ttggcagtgt	tatactatta	tataacctga	aaaaacaac	360
aggtaatttt	cacacaaagt	aatagatata	atgacacatt	taaaataggg	cactactgga	420
acacacagat	aggacatcca	ggttttgggt	caatattgta	gactttttgg	tggatgagat	480
atgcagggtg	atrcacagaag	gacaacaaaa	acatatgtca	gatagaaggg	aggagcaaat	540
gccaaagagct	ggagctgagg	aagatcactg	tgaatttcta	tgtagtctag	ctggctggat	600
gctagagcaa	agaggtgg					618

<210> 72

<211> 806

<212> DNA

<213> Homo sapien

<400> 72

tctacgatgg	ccatttgctc	attgtctttc	ctctgtgtgt	agtgagtgac	cctggcagtg	60
tttgcttgct	cagagtggcc	cctcagaaca	acagggctgg	ccttggaata	accccaaac	120
aggactgtgg	tgacaactct	ggtcagggtg	gatttgacat	gagggccgga	ggcggttgct	180
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ccagtcccc	ttcaaccag	ttgatgtaac	cacctcattt	ttacaaata	cagaatctat	420
tctactcagg	ctatgggcct	cgtcctcact	cagttattgc	gagtgttgct	gtccgcagtc	480
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ccctttaatg	ggattgaaag	cacttttacc	acatggagaa	atataatttt	aatttgtgat	660
gcttttctac	aaggtccact	atttctgagt	ttaatgtgtt	tccaacactt	aaggagactc	720
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<210> 73
 <211> 301
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(301)
 <223> n = A,T,C or G

<400> 73
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 agtcctttca ggctagctgc atcaactctg ctgattttgt tgccatcaag atgtaattcc 180
 gtaaggggaag gaggaagacc ttgaggaatg ctggygatat tgyyatcagc aatgcggatg 240
 tasgaagagc ttcttcmctc cctggaaagc cccattttca atyccttgag ctcttcakcg 300
 g 301

<210> 74
 <211> 401
 <212> DNA
 <213> Homo sapien

<400> 74
 agttttacatg atccctgtaa cagccatggt ctcaaactca gatgcttcct ccatctgccca 60
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 ggtccacaga gcactcatct ggctgggcta tgggtggtgg ggctctactc aagaagcaaa 180
 gcagttacca gcacattcaa acagtgtatt gaacatcttt taaatatcaa agtgagaaac 240
 aagaaggcaa cataataatg ttatcagaaa gatgttagga agtaaggaca gctgtgtaaa 300
 gcttgaggct gaaaagtagc ttgccagctt catttctttg gtttcttggg tagtgggccg 360
 ccggaacagc aagatgtgag gttctggttc atggatcata t 401

<210> 75
 <211> 612
 <212> DNA
 <213> Homo sapien

<400> 75
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 tattgcacaa tgcctctgatc aatccttctt tttctctttt gccacaaatt taagcaagta 180
 gatgtgcaga agaaatggaa ggattcagct ttcagttaaa aaagaagaag aagaaatggc 240
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 aacagactgg gccaatgtcc acaaagaatt cctggtcagc accaccgatg tccaaagggtg 360
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 tgccagtcct ctatccatg tatgcaatgc tgttcttgca gtggtaggtg atgttctgag 600
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<210> 76
 <211> 844
 <212> DNA
 <213> Homo sapien

<400> 76

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accaaggatg	caaatgggat	gctatcaagg	tattctgtaa	tatggaaact	ggggaaacat	180
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agaagaaaca	cgtttgggtt	ggagagtcca	tggatgggtg	ttttcagttt	agctacggca	300
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gccgagcttc	ccagaacatc	acatatcact	gcaaaaatag	cattgcatac	atggatcagg	420
ccagtggaaa	tgtaaagaag	gccctgaagc	tgatggggtc	aaatgaagg	gaattcaagg	480
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tattcaatga	ttgtcttgcc	ccattcattt	gtcttttttg	agcagccatc	gactaggaca	720
gagtaggtga	acctgctgtt	gccctcagca	acaagttcca	catcgttgga	acctgcaga	780
agcacagcct	tgttcaarct	gccgctctcc	tcatccagat	acctcggccg	cgaccacgct	840
aatc						844

<210> 77

<211> 314

<212> DNA

<213> Homo sapien

<400> 77

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gacacttaga	tttctctctt	gtgggaagaa	accacctgtc	catccactga	ctcttctaca	120
ttgatgtgga	aattgctgct	gctaccacca	cctcctgaag	aggcttccct	gatgccaatg	180
ccagccatcc	tggcatcctg	gccctcgagc	aggctgcggt	aagtagcgat	ctcctgctcc	240
agcctgtctt	ttatgtcaag	cagcatcttg	tactcctggg	tctgagcctc	catctcgcat	300
cgagctcac	tcag					314

<210> 78

<211> 548

<212> DNA

<213> Homo sapien

<400> 78

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tcccattgcta	tcttctaaga	taactacaaa	tattcttcaa	agatttaact	gagttctgcc	120
aaggacctcc	caggactcta	tccagaatga	ttattgtaaa	gctttacaaa	tcccaccttg	180
gccctagcga	taattaggaa	atcacaggca	aacctcctct	ctcggagacc	aatgaccagg	240
ccaatcagtc	tgcacattgg	ttttgttaga	tactttgtgg	agaaaaacaa	aggctcgtga	300
tagtgcagct	ctgtgcctac	agagagcctc	ccttttgggt	ctgaaattgc	tgatgtgaca	360
gagacaaaagc	tgctatgggt	ctaaaacctt	caataaagta	actaatgaca	ctcaaggctc	420
tgggactctg	agacagacgg	tggtaaaacc	cacagctcgg	attcacattt	ccaatttatt	480
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gcacagtc						548

<210> 79

<211> 646

<212> DNA

<213> Homo sapien

<400> 79

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tgcattggaa aagggtctta gtatagttta ggatggatgt gctgataata ataaaatgat 180
aagatatgca tagtggggga ataaagcctc agagtccttc cagtatgggg aatccattgt 240
atcttagaac cgaggggattt gtttagattg ttgatctact aatttttttc ttcacttata 300
tttgaatttt caatgatagg acttattgga aattggggat aattctgttg tggattataa 360
taatatcat tttttaaaaa ctcatcttg tattgagtta gtgcattgac ttccaatgaa 420
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aataggcaac aatgtatttt ataagcactg cagagattta gtaaaaaaca tgtatagtta 540
ctttagaaac aacttctgac acttgagggt tacccaatgg tctccttccc attctttata 600
tgaggtaaag gcaaacagg gagccaccga ataacagcc ctgagt 646

```

<210> 80

<211> 276

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(276)

<223> n = A,T,C or G

<400> 80

```

gtctgaatga gcttcnctgc gagatgganc ancataaccc agaantccaa aancntanng 60
aacgnnaaaa cccgntngaa caagnaaacn gcaactnacg gccgcctgnt gnagggcgag 120
gacgcccacc tctcctcctc ccagttctcc tctggatcgc agncatccan agatgtgacc 180
tcttccagcc gccaaatccg caccaagggt atggatgtgc acgatggcaa ggtgggtgtc 240
caccacgaa caggtccttc gcaccaagaa ctgagg 276

```

<210> 81

<211> 647

<212> DNA

<213> Homo sapien

<400> 81

```

gtcctgcctt tcatcttttc tttaaaaaaa ataatgttt aaaaaacatt tccctcagat 60
tttaaaattc atggaagtaa taaacagtaa taaaatatgg atactatgaa aactgacaca 120
cagaaaaaca taaccataaa atattgttcc aggatacaga tattaattaa gagtgacttc 180
gttagcaaca cgtagacatt catacatatc cggtggaaga ctggtttctg agatgcgatt 240
gccatccaaa cgcaaatgct tgatcttggg taggrtaat ggccccagga tcttgagaa 300
gctctttatg tcaaacttct caagttgatt gacctccagg taatagtttt caagggtttc 360
attgacagtt ggtatgtttt taagcttggt ataggacaga tccagctcaa ccagggatga 420
cacattgaaa gaatttccag gtattccact atcagccagt tcgttgtag ataaacgcag 480
atactgcaat gcattaaaac gcttgaaata ctcatcaggg atgttgctga tcttattgtt 540
gtctaagtag agagttagaa gagagacagg gagaccagaa ggcagctctg ctatctgatt 600
gaagctcaag tcaaggtatt cgagtgtatt aagaccttta aaagcag 647

```

<210> 82

<211> 878

<212> DNA

<213> Homo sapien

<400> 82

```

ccttctttcc ccactcaatt ctctctgccc tgttattaat taagatatct tcagcttcta 60
gtcagacaca atcagaatya cagaaaaatc ctgcctaagg caaagaaata taagacaaga 120
ctatgatatc aatgaatgtg ggttaagtaa tagatttcca gctaaattgg tctaaaaaag 180

```

```

aatattaagt gtggacagac ctatttcaaa ggagcttaat tgatctcact tgttttagtt 240
ctgatccagg gagatcaccc ctctaattat ttctgaactt ggtaataaaa agtttataag 300
atttttatga agcagccact gtatgatatt ttaagcaaat atgtttattt aaatattgat 360
ccttcccttg gaccaccttc atgttagttg ggtattataa ataagagata caaccatgaa 420
tatattatgt ttatacaaaa tcaatctgaa cacaattcat aaagatttct cttttataacc 480
ttcctcactg gccccctcca cctgcccata gtcaccaaat tctgttttaa atcaatgacc 540
taagatcaac aatgaagtat tttataaatg tatttatgct gctagactgt gggcctaaatg 600
tttccatttt caaattattt agaattctta tgagtttaaa atttgtaaat ttctaaatcc 660
aatcatgtaa aatgaaactg ttgctccatt ggagtagtct cccacctaaa tatcaagatg 720
gctatgatgt aaaaagagaa aatatgggtc agtctaaaaa ggctaattgt cctatgatgc 780
tattatcata gactaatgac atttatcttc aaaacaccaa attgtcttta gaaaaattaa 840
tgtgattaca ggtagagAAC ctcgccgcg accacgct 878

```

```

<210> 83
<211> 645
<212> DNA
<213> Homo sapien

```

```

<400> 83
acaaacattt tacaaaaaag aacattacca atatcagtgg cagtaagggc aagctgaaga 60
ataaatagac tgagtttccg ggcaatgtct gtctcaaaag acatccaaac tgcgttcagg 120
cagctgaaac aggtctcttt cccagtgaac agcatatgtg gtcagtaata caaacgatgg 180
taaattgaggc tactacatag gccaggttaa caaactcctc ttctcctcgg gtaggccatg 240
atacaagtgg aactcatcaa ataatttaaa cccaaggcga taacaacgct atttcccatc 300
taaactcatt taagccttca caatgtcgca atggattcag ttacttgcaa acgatcccgg 360
gttgtcatac agatacttgt ttttacacat aacgctgtgc catcccttcc ttactgccc 420
cagtcagggt tcctgttggt ggaccgaaag gggatacatt ttagaaatgc ttccctcaag 480
acagaagtga gaaagaaagg agaccctgag gccaggatct attaaacctg gtgtgtgcgc 540
aaaaggagg ggggaaggcag gaatttgaaa ggataaacgt ctcttttgcg ccgaggaatc 600
aggaagcgtg actcacttgg gtctgggacg ataccgaaat ccggt 645

```

```

<210> 84
<211> 301
<212> DNA
<213> Homo sapien

```

```

<220>
<221> misc_feature
<222> (1)...(301)
<223> n = A,T,C or G

```

```

<400> 84
tctgatgtca atcacaactt gaaggatgcc aatgatgtac caatccaatg tgaaatctct 60
cctcttatct cctatgctgg agaaggatta gaaggttatg tggcagataa agaattccat 120
gcacctctaa tcatcgatga gaatggagtt catgggctgg tgaaaaatgg tatttgaaac 180
agataccaag ttttgtttgc cagcatagga atagctttta tttttgatag accaactgtg 240
aacctacaag acgtcttggg caactgaagn ttaaatatcc acangggttt attttgcttg 300
g 301

```

```

<210> 85
<211> 296
<212> DNA
<213> Homo sapien

```

```

<220>

```

<221> misc_feature
<222> (1)...(296)
<223> n = A,T,C or G

<400> 85
agcgtgggtc gcggcncgan gtagagaacc gactgaaacg tttgagatga agaaagtctt 60
cctcctgac acagccatct tggcagtggtc tgttggtttc ccagtctctc aagaccagga 120
acgagaaaaa agaagtatca gtgacagcga tgaattagct tcagggtttt ttgtgttccc 180
ttacccatat ccatttcgcc cacttccacc aattccattt ccaagatttc catggtttan 240
acgtaatttt cctattccaa tacctgaatc tgcccctaca actccccctc ctagcg 296

<210> 86
<211> 806
<212> DNA
<213> Homo sapien

<400> 86
tctacgatgg ccatttgctc attgtctttc ctctgtgtgt agtgagtgc cctggcagtg 60
tttgccctgt cagagtggcc cctcagaaca acagggctgg ccttggaaaa accccaaaac 120
aggactgtgg tgacaactct ggtcaggtgt gatttgacat gagggccgga ggcggttgct 180
gacggcagga ctggagaggg tgcgtgcccg gcactggcag cgaggctcgt gtgtcccca 240
ggcagatctg ggcactttcc caaccaggt ttatgccgtc tccagggaag cctcggtgcc 300
agagtgggtg gcagatctga ccattccccac agaccagaaa caaggaattt ctgggattac 360
ccagtcccc ttcaaccag ttgatgtaac cacctcattt ttacaaaata cagaatctat 420
tctactcagg ctatgggctt cgtcctcact cagttattgc gagtgttgct gtccgcatgc 480
tccgggcccc acgtggctcc tgtgctctag atcatggtga ctcccccgcc ctgtgggttg 540
aatcgatgcc acggattgca ggccaaattt cagatcgtgt ttccaaacac ccttgctgtg 600
ccctttaatg ggattgaaag cacttttacc acatggagaa atatattttt aatttgatg 660
gcttttctac aaggtccact atttctgagt ttaatgtgtt tccaacactt aaggagactc 720
taatgaaagc tgatgaattt tcttttctgt ccaaacaagt aaaataaaaa taaaagtcta 780
tttagatgtt gaaaaaaaa aaaaaa 806

<210> 87
<211> 620
<212> DNA
<213> Homo sapien

<400> 87
tttttgcatc agatctgaaa tgtctgagag taatagtctt tgttgaattt tttttgttc 60
atttttctgc acagtccatt ctgtttttat tactatctag gcttgaaata tatagtttga 120
aattatgaca tccttcctct ttgttatttt cctcatgatt gctttggcta ttcaaagttt 180
atttttagtt catgtaaatt tttgaattgt attttccatt attgtgaaaa tagtaccact 240
gcaattttta taggaagttt attgaatcta tagattactt tggataatat ggcacttcaa 300
taatattcat gttttcaatt catagacaaa atattttaaa atttatttgt atcttttcta 360
atttttcctt tttttattgt aaagatttac ctcttggtt aatattttcc tcagaaattt 420
attatttaag gtatagtcaa taaaattttt ttctctatt ttgtcagata gtttaagtgt 480
atgaaaccat agatatactt gtatgttaat tttatatttt gctaatttac tgagtgtatt 540
tattagttta gagaggtttt aatgtractgt ttatggtttt ttaaatataa gattacttat 600
tttttaaaaa aaaaaaaaaa 620

<210> 88
<211> 308
<212> DNA
<213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(308)
 <223> n = A,T,C or G

<400> 88
 tagctgtgnt cagcaggccg aggttttttt tttttttgag atggagtctc gccctgtcac 60
 ccaggctgga gtgcagtggc ctgatctcag ctacttgcaa gctccacctc ctggattcac 120
 gctattctcc tgcctcagcc tcccaagtag ctgggactac aggcgcccgc caccacgccc 180
 agctaattnt ttgnattttt agtacnagat gcggtttcat cgtgttagcc agcatggnc 240
 cgatctcctg acctegtga ctgcccgcc cggcctccca aagacctgcc cgggcnggcc 300
 gctcgaaa 308

<210> 89
 <211> 492
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(492)
 <223> n = A,T,C or G

<400> 89
 agcggccgcc cgggcaggtc tgtaagtaa catacatatc accttaataa aaatcaagat 60
 gaaatgtttt agaaactatt ttatcaaaag tggctctgat acaaagactt gtacatgatt 120
 gttcacagca gcactattaa tgccaaaaag tagacaaaac ctaaatgtcc attaaactgat 180
 aagcaaaatg tggatatatc atacaatgga atattatgta gcccaaca tggcatggag 240
 tactacaaca tggatgagcc tcaaaaacgt tatgctaaat gaaaaaagtc agatatagga 300
 aaccacatgt catatgatcc catttatatg aaatagccag aaaaggcaag tcatagaaac 360
 aagatagatc ggaaaatggg ttggaggact acaaatggca ccagggatct ttgaagttga 420
 tggaaatggt ctaaaatcag actgtgntg tggttgaaca agtctgtaaa ttaccaaaa 480
 tgcgttaata ca 492

<210> 90
 <211> 390
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(390)
 <223> n = A,T,C or G

<400> 90
 tcgagcggcc gcccgggcag gtacaagctt tttttttttt tttttttttt ttttctaaca 60
 gttctctgtt ttattgcaat acagcaaagt ctgggttaata ttaagngata tcaacataaa 120
 gtattggtga ggagtccttt gtgacatttt ttaccatccc accttaataa ttctctgtga 180
 aaanaatcca catcattggt tgggtancana ggatctctta aaaagttccc taanacactg 240
 agggcataaa accaaacaaa ataaaataag gagtgatagg ctaaagcagt atcttcccct 300
 ccattccatc ttgncaagca ttatattcta accaaaaaat gatcacacca ggccatgcaa 360
 aactgtccaa tattaccgag aaaaaaccct 390

<210> 91
 <211> 192

<212> DNA

<213> Homo sapien

<400> 91

```

agcgtggtcg cggccgaggt ctgtcaatta atgctagtc ttaggattta aaaaataatc      60
ttaactcaaa gtccaatgca aaaacattaa gttggtaatt actcttgatc ttgaattact      120
tccgttacga aagtccttca cttttttcaa actaagctac tatatttaag gcctgcccgg      180
gcggccgctc ga                                     192

```

<210> 92

<211> 570

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(570)

<223> n = A,T,C or G

<400> 92

```

agcgtggtcg cggccgaggt ctgacaacta acaaagaagc aaaaactggc atcttggaca      60
tcctagtatt acacttgcaa gcaattagaa cacaaggagg gccaaggaaa aagtttagct      120
ttgaattact tccaaatcta ctgattttga ggttccgcag tagttctaac aaaacttttc      180
agacaatggt aactttcgat taagaaagaa aaaaacccca aacatcttca ggaattccat      240
gccaggttca gtctcttcca gtgagcccgc ttgctaaaag tccacgtgca ccattaatta      300
gctgggctgg cagcaccatg taaaaagaag cctattcacc accaaccaca cagactagac      360
atgtaaagta ggatcaagta atggatgaca accatggctg tggaatatgg tcaatgagag      420
tcagaaaagt acaggcacca gtacaagcag cagataacag aattgacggg ccaaaggata      480
aaaataggct tattttaata ggatgctaca gaacacatnc acttctaatt ggaagctgct      540
ttacactggg tggcattgna ccatatgcat                                     570

```

<210> 93

<211> 446

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(446)

<223> n = A,T,C or G

<400> 93

```

tcgagcggcc gcccgggcag gtccaggttt ttatttagtt gtgtaatctt ggacaagtta      60
cctaactttt ttgagtctga atatatataa tctgcaaaat gagaatcatg ataatacgtc      120
ataggcttaa ttaggaggat taaatgaaat aatttatagg tgggtgccatg gttacataca      180
agtattagta gtttaattctt ttcctttgtt tacttttata gtatagggtg gatgaagggt      240
ccagtatagg caaaaataact acttgggggt aaagtagagt gtgatacttt atttgaaatg      300
ttccctgaat ctgatcttta ctttttgnta ctgctgcact acccaaatcc aaattttcat      360
cccaacattc ttggatttgt gggacagcng tagcagcttt tccaatataa tctatactac      420
atcttttctt actttgggtc tttttg                                     446

```

<210> 94

<211> 409

<212> DNA

<213> Homo sapien

<400> 94
 cgagcggccg cccgggagg tccatcagct cttctgctta gaatacagg cagacagtgg 60
 agaggtcaca tcagttatcg tctatcaggg tgatgaccca agaaagggtga gtgagaaggt 120
 gtcggcacac acgcctctgg atccacccat gcgagaagcc ctcaagttgc gtatccagga 180
 ggagattgca aagcgccaga gccaacactg accatgttga aggcgttctc tccaggctgg 240
 attcactgca ctcggaagaa ttctgcccag ggaatttagt gtgggggtac caggaccagt 300
 ttgtcttgat cttgagaccc ccagagctgc tgcattccata ggggtgttga ggactacacc 360
 tggcctgcct tgcagtcatt ctttcttata tgttgaccca ttgcccga 409

<210> 95

<211> 490

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(490)

<223> n = A,T,C or G

<400> 95
 tcgagcggcc gcccgggcag gtcctacttg tttgcagctt ccacacactg cacctaccta 60
 ctacctctct tccatgctta actgggttta gaaagggtgag ctatgcgtag aagaactact 120
 tgggatattc aagtgtctga tttgaacgat aagcctatag ataacagtct gaagctgcaa 180
 gggagacttt gttagtacac tactataaac aggtaaacta cctgtttgta cttgatatag 240
 tgcataatgaa atgactgatt taatacaaaa ctacagaaca tgcaaaattt tttctgagat 300
 gttaagtatt acttcagtgg agaacaaaac ttacttaacc tttcgctaag gcatgtagta 360
 ccagaaagca aacatgggtt tagcttcctt tactcaaaat atgaacatta agtggttgtg 420
 aattttgtct gccaaagtgg tcagaaaata cattataaat aacctaagtt aaaaaaaga 480
 aactgngaac 490

<210> 96

<211> 223

<212> DNA

<213> Homo sapien

<400> 96
 agcgtggctg cggccgaggt ctggaagccc accctaggac ttgaatggca ccttgctcctt 60
 tctctgccag taatgcaatc caacacaata tgctacaggg aaaacagaat ttccacgggtg 120
 ccgccctctg gtacaaggga aacagcacgc aaagcaaaag gccacagagg gctccctgag 180
 aatccagtac aactaagcga ggacctgccc gggcgccgcg tcg 223

<210> 97

<211> 527

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(527)

<223> n = A,T,C or G

<400> 97
 tcgagcggcc gcccgggcag gtctgtgcag gagacactga agtgggtagt gtccataatc 60
 tttttagcct gttgctgaaa ttccagttgt actccttcaa accaaaaatgc ttacaggatc 120

```

atgggaaagc ctcgggtgca gaaatcaaga caggcaagtg ggaagataac tcggccttga 180
ggttaaacag atctgggttc aaagcatagt ttcactctct gtcttgtaa gtgtcctggg 240
tgaagtcatt tcctctcttg aatttcagag aggatgaaa tataaaaagt ataataacta 300
tcttcataat ctttgtgagg attaaagaag acgaagtgtg tgaaaagcta agcacagagc 360
aggcattcta caataagtag ttattatatt tggaaaccat ccgnccttag cccagccca 420
attaccttct cttagnctct tcatatcgaa ngccgtaatc ttgaccttct cttgcnactg 480
gattgggtgct gggtgatgcc caaacttccc gagatgctgt ctgggaa 527

```

<210> 98

<211> 514

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(514)

<223> n = A,T,C or G

<400> 98

```

tcgagcggcc gcccgggcag gtctggctcc catggccctt ggggtggcct gactctgtca 60
ctattcctaa aaccttctag gacatctgct ccaggaagaa ctttcaacac caaaattcat 120
ctcaatttta cagatgggaa aagtgattct gagaccagac cagggtcagg ccaagggtcat 180
ccagcatcag tggctgggct gagactgggc ccaggggaacc ctgtctgtct ctctttttcc 240
cagagctgtg agttctctag ccaaggctgc actcttgagg gagagccagg aagcatagct 300
gaggccatga caacctcact cttcacctga aaatttaacc cgtggcagag gatccaggca 360
catataggct tcggagccaa acaggacctc ggccgcgacc acgctaagcc gaattccagc 420
acactggcgg ccgttactag tggatcccga gcttnggtac caagcttggc gtaatcatgg 480
gcatagctgg ttcctggggg gaaaatggta tccc 514

```

<210> 99

<211> 530

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(530)

<223> n = A,T,C or G

<400> 99

```

tcgagcggcc gcccgggcag gtctgaagaa acaggataaa atttggcagc cagtaatttt 60
gacaggggaag ttacagcttg catgacttta aatatgtaaa tttgaaaata ctgaatttcg 120
agtaatcatt gtgctttgtg ttgatctgaa aaatataaca ctggctgtcg aagaagcatg 180
ttcaaaaata ttttaattcac ttcaaaatgt catacaaatt atggtggttt ctatgcaccc 240
ctaaagcttc aagtcattta gctcaggtag atactaaagt aatatattaa ttcttccagt 300
acagtgggtg ttcataccat tgacatttgc ataccctaga ataatttaag aaagacatgt 360
gtaatattca caatgttcag aaaagcaagc aaaaggtaa ggaacctgct ttggttcttc 420
tggagatggn ctcatatcag cttcataaac attcattcta caaaatagta agctaaccat 480
ttgaaccca atttccagat taagcatatt ttctcataaa tnatgaagcc 530

```

<210> 100

<211> 529

<212> DNA

<213> Homo sapien

<400> 100

agcgtggtcg	cggccgaggt	ccaggcacgg	tggcttatgt	gtgtaatccc	agcacttggg	60
gaggctgagg	gaggtggatc	acttgagtc	aggagtttga	gaccagtctg	ggcaacatgg	120
cgaaacttca	tcactaccaa	agaagaaaaa	aattagccag	gtgtggtggg	gtatgcctgt	180
agtcccagat	actctgggtg	ctgaggtgag	aggatagctt	gagcccagga	aattgaggct	240
gcagtgaact	atgattgcac	tactgtgctc	cagcttgggc	aacagagtga	gatcttgtct	300
ccaaaagtcc	ttgaaggatt	ttaggaagtt	gttaaaagtc	ttgaaacgat	gtttgggggc	360
atgttagggg	tcttgaatgt	ttaattcctc	taataactgc	ttattcaaga	gaagcatttc	420
tgactgggtg	cggggcagtg	gcttcatgcc	ccataatccc	agtactttgg	gaggctgaag	480
caggaacatt	gcttgagccc	aggacttcaa	gaacagcctg	ggtaacata		529

<210> 101

<211> 277

<212> DNA

<213> Homo sapien

<400> 101

tgcagcggcc	gcccgggcag	gtcgcaggaa	gaggatggaa	actgaggagt	ccaggaagaa	60
gagggaaacga	gatcttgagc	tggaaatggg	agatgattat	atcttgatc	ttcagaagta	120
ctgggattta	atgaatttgt	ctgaaaaaca	tgataagata	ccagaaatct	gggaaggcca	180
taatatagtt	gattatattg	atccagccat	catgaagaaa	ttggaagaat	tagaaaaaga	240
agaagagctg	agaacagacc	tcggccgcga	ccacgct			277

<210> 102

<211> 490

<212> DNA

<213> Homo sapien

<400> 102

gcgtgggtcg	ggccgaggtc	tgacggcttt	gctgtcccag	agccgcctaa	acgcaagaaa	60
agtcgatggg	acagtrtagag	gggatgtgct	aaagcgtgaa	atcagttgtc	cttaattttt	120
agaaagattt	tggtaactag	gtgtctcagg	gctgggttgg	ggtccaaagt	gtaaggaccc	180
cctgccctta	gtggagagct	ggagcttggg	gacattacc	cttcacaga	aggaattttc	240
ggatgttttc	ttgggaagct	gttttgggtc	ttggaagcag	tgagagctgg	gaagcttctt	300
ttggctctag	gtgagttgtc	atgtgggtaa	gttgaggtta	tcttgggata	aagggtcttc	360
tagggcacaa	aactcactct	aggtttatat	tgtatgtagc	ttatattttt	tactaagggtg	420
tcaccttata	agcatctata	aattgacttc	tttttcttag	ttgtatgacc	tgccccgggc	480
ggccgctcga						490

<210> 103

<211> 490

<212> DNA

<213> Homo sapien

<400> 103

gagcggccgc	ccgggcaggt	ccaaaccagc	ttgctcataa	gtcattaacc	aaatccatta	60
taggtaattt	gttcagttca	atgtttacaa	ttcttatgga	aaaaattagc	aacacacaca	120
tttaaaacgt	gtgcatttac	ctttgcgtga	gtgcttaaaa	tacatatttc	tatttcaaga	180
tgacatttaa	aaattattct	aatatatcag	cagcaaaaaa	ataatttgca	attacaaaaa	240
actaaaactag	aatccttaag	ttattctcat	gtttacagtt	gtgattcttt	aataaatact	300
attatgcagc	tctattgttt	aagctttctg	gatttgggtt	aaacacatgc	atatatattg	360
tcaattgtgg	gaagctttac	aagttatatt	ccatgcactt	tttggacaga	gttctaacag	420
agccagccag	tccacaaaa	aggcaagaca	aaagttgaat	taactggggc	aaaataggac	480
tcttatgcaa						490

<210> 104
<211> 489
<212> DNA
<213> Homo sapien

<400> 104
cggtggtcgcg gccgaggtcc aggtctggtct cgaactcctg accttgtgat ctgcccgcct 60
cggcctccca aagtgttggg attacaggca tgagccactg cgcccgaccg agttgaacat 120
ttaatgtcag actaggccag agtttctcaa tctttttatt ctcaactccc aaaggagccg 180
ttggagattt tccccccaat ctctctcctt catgaaattt cataccacaa atatagtatg 240
ttttatttat gtactgtgac cctttgaagg atcacaaacc aatataatag tttttctttt 300
taaccgcgtca aggaccaagt ttttgcccct gttggaaatg cataaactgg actgatgaat 360
tggtatagat ggcttttatc atgaggatca gaaaaacttg aaattccttg gctacgacac 420
tccatattta tcaccgtata gggaggacct tggtagggg aagtagaaac acttctacac 480
tttacagca 489

<210> 105
<211> 479
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(479)
<223> n = A,T,C or G

<400> 105
gcgtggtcgc gccgaggtc tgactggctt cagccccaga agttgagctg gcctttagac 60
aaaataattg caccctccctc tgctgcttat tcccttccgt ttttcatttg agtgtgaaca 120
gttagataaa atctgtggct gnetcttcca ccttgcctta gtttccattg ctgtgagcag 180
gccctcctat gccccgcatt tagctacaat gctgtggact cacttgattc tttttctccg 240
agctttgtct agaaatatgt gaaggtgagg ttaagtgtt ctctgtgtag atccacttag 300
ccctgtctgc tgtctcgatg ggcgttgcct cgtctctcct ctcttccatc ctttccattt 360
gcttctcacc accttctggc ttcttttctt aatgcaataa aggcagtttc taacaaagaa 420
agaatgtggg ctttggagtt agacagacct ggntttaaat tctgcttctg gctctccaa 479

<210> 106
<211> 511
<212> DNA
<213> Homo sapien

<400> 106
tcgcggccga ggtccaaaac gtggattcca atgacctgcc ttgagcccg gcgttgccagg 60
agttggacct gcagtagtat gggaagctca cggcctaaat accgactgcc ctctgacccc 120
accgtccagc gattctagaa catttctagt aggaagaca tagcaaggga ttttcatgat 180
tgggaaatac tgggagacaa gctgaagatt tgttaagggc tatgcttctg tcatctttta 240
ggattttaag gctactcctt tagctagcta ctttgagctg tttaaagtga ctatctccct 300
acacagagtt acacaatgag catctctgaa agagaatatt accctggatt tccaaagatg 360
tactctaaca ggaatgaccag gcaaaaaggc acccggggga ggagtctgtt ataacactcg 420
gaccacatg ttctcaaggc acttcagaac tttgggaaat cattttgtac cggatcctca 480
gaaagcattt atggaaatac acatccttta g 511

<210> 107
<211> 451
<212> DNA

<213> Homo sapien

<400> 107

```

ggccgcccgg gcaggtccag aatatcaa at caaaagggtca caaatgttca cttcctcctc      60
caccctctta catattggat cttcaattgc aatagggagt gtaagatggg catttttagag      120
acgtagtgtgc atcagcagaa gcaaaccat cttatacaaa tgggttttgg ggataggaaa      180
aggctgctaa aaattcacaa gtcaccatc cccagaagca atgaatagcc gtagaagacc      240
aaggaagatc aacaagtttc caaagtgcta aagccagaga tttggccctt ccaaaatacc      300
accaggacgc ctggaccctg gggctctccg catgtcacca ctgactgcca ggatgctgct      360
gcacctccct tccttgagac acaacagaga gacagtgaag tcaccaaga ctgggatcat      420
cagaggctcc tcattgctgc tacagagaag c                                451

```

<210> 108

<211> 461

<212> DNA

<213> Homo sapien

<400> 108

```

ccgcccgggc aggtcctgaa aacattcaga ctaatcaaaa tgggtactact gtaacttctt      60
ataatacata atataaaagt ttttgaaaga tatagacaca attaacccct aaacaacaca      120
ctatctgatt ctcaaaagca atggctatct aacaagatgt aaaaggacaa taacatatca      180
aagaactttc acacacctaa agatagcatt tagcagcaag ttagtcagac aaaacaaaca      240
caaatatctt cacatttctt atgtttgttt ttaactttac ttcataaagc cactgataat      300
tgaggtttct ttcaagtata agatttctaa aattaaaaac tgtttttgac atatttttat      360
aaagaaataa aaagcaaaac gcaatccaac tatttatatg agtcctctct ctccaacagc      420
tttagatggt tttctgagta cttttttaca cagaatattt t                                461

```

<210> 109

<211> 441

<212> DNA

<213> Homo sapien

<400> 109

```

ggccgcccgg gcaggtctga ttataagaga aagaaatcca gtgacacgag ggcaggcagg      60
ccccgctctg ctctgatcga gaaaagcttc ctgatgtcag ggagatggaa ctgccaccat      120
cagaaccatg gcactttggg tgaagggtgt tcagcgacca agggggcagg aaatgggcag      180
tgactaaggg ggcaggaaac aggcaggcac atggcaaggt tctcccagcc catcagccca      240
gtgatggcct cgattttgaa gctgcactac tgtctgaaaa gcacaattac tgggtactct      300
taacaaactt cagcatactg gggaaggaga ctgtcaagta actgaattgg aaagatgaaa      360
aagaaccatc tctaaaagt gatgcttgtc agaagaataa cctcctttgt gcaagtcttg      420
caacatcttc attcaaccac a                                441

```

<210> 110

<211> 451

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(451)

<223> n = A,T,C or G

<400> 110

```

ggtcgcggcc gaggtctggg gaaggggtga gaatccctgg gccttgccca gtcctgagct      60
ctgggtgtct gcaggggaag acagtgggtga gttagtgtta aagaaagcat ccagagaggt      120

```

```

aagaggggct tgggtagcac cctttgcctc tgtcacttcc gcaaaaactt cttgttgagg 180
aggaagatga gaaggttgac attgactttg gccttggtga agagtttcat gacagccaca 240
ccctcatact ggagctgcan gagatcctga tagtgaagct tgaaatcgct ccatgtccac 300
acccaggaac ttggcattta cttcaaactt tcctgcctca tctcccggcg tgatgtcaaa 360
natgacgttt cttgaagtga gaggcgggaa agatcttcaa tttccaccaa agacaccctt 420
tttccaggaa gcttgagcaa caagtgtaat g 451

```

<210> 111

<211> 407

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(407)

<223> n = A,T,C or G

<400> 111

```

ggcgcagctt cgacctgact tctttngagc agntgncact acccgtcttg aggaatgccg 60
actgcagaca gtggcccang gcaaagagtg tgcgtcatcg atganattgg naagatggag 120
ctcttcagtc agnttttcat tcaagctgnt cgctcagacgc tgtctacccc agggactata 180
atcctnggca caatcccagt tcctanagga aagccactgn ctcttgtaga agaaatcana 240
cacanaaagg atgtgaacng tgtttaatgt caccaaggga aaacatgaaa ccaccttctg 300
ccagatatcg ggacgttgcg tgcagatcaa gcacgnaagt gaagacgcgt gcattccttg 360
ccttccgtga acgantgccc agntcaagaa gancctgatg gaaccct 407

```

<210> 112

<211> 401

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(401)

<223> n = A,T,C or G

<400> 112

```

tcgcggccga ggtcggccga ggtctgacat ctgttgctcg tgataaccac ttctgtattg 60
cgtcttaacc acctctgtat tgtgtggttt taactgccta aggcggcaat gggcagtggg 120
cccccttccc ttaggatggg tatcaattca acaatattta taaggcattt actgtgtgct 180
aagcatttgg aagacccagg ctacaaaata agacatagtt cctgccctcc aggccagcag 240
agggaggcac aaatacccag gaatctctga tgggtgtgaa gtgcggtcgt gggccacaga 300
aaatgaccgt catggagacc ctgctaaagg tcggaccctg agcccaaagg ggtattcaga 360
agnngagatg attttgccc cactcataga tgggtggcaa a 401

```

<210> 113

<211> 451

<212> DNA

<213> Homo sapien

<400> 113

```

gtcgcggccg aggtccatat taaaaagtcc atcataaaca aagactcctc ctcatggtat 60
gaatatgctc catatgccca taatggtgca taacggactt agaaattcca atgagtctta 120
gggttgaat ttccaatgac ctgagcaagg cagctcccta tagcttctcg ataacatttt 180
acaccagag ttcaggctta aacagacctt tcaacacaaat tattttcggg ttgtctgtct 240

```

```
agaaaaacggc aatgctcaaa ggaatataaa taagggtggg gggacatatg cttccagcct 300
ggcctttctc catgtggtaa aaaacaatgg aatggctgtg ttaatttttt ttaaatcttt 360
tctgaccttt actatgtttg gtaatggaaa taagtcaggg aaaacaaaat gaacaggtct 420
catcacttaa ttaatactgg gttttcttct t 451
```

<210> 114
<211> 441
<212> DNA
<213> Homo sapien

```
<400> 114
ggccgcccgg gcaggtccat cctgtcagag atgggagaag tcacagacgg aatgatggat 60
acaaagatgg ttcactttct tacacactat gctgacaaga ttgaatctgt tcatttttca 120
gaccagttct ctggtccaaa aattatgcaa gaggaaggtc agcctttaaa gctacctgac 180
actaagagga cactgttgtt tacatttaat gtgcctggct caggtaacac ttacccaaag 240
gatatggagg cactgctacc cctgatgaac atgggtgattt attctattga taaagccaaa 300
aagttccgac tcaacagaga aggcapacaa aaagcagata agaaccgtgc ccgagtagaa 360
gagaacttct tgaaacttga cacatgtgca aagacaggaa gcagcacagt ctcggcggga 420
ggaagaaaaa aagaacagag a 441
```

<210> 115
<211> 431
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(431)
<223> n = A,T,C or G

```
<400> 115
gccgcccggg caggtccatt ggcggtgaca aaaggaaaag aagcaaagag actcagttcca 60
taatgctgat tagttagaag aaagggctag gattgagaaa gtaccaggaa cttttaatta 120
tttaaaagag aatgctgact gttaatgttt taaatcttac tgttcaaag tactaatatg 180
aatttttacc ctttgtgcat gaatattcta aacaactaga agacctccac aatttagcag 240
ttatgaaagt taaacttttt attataaaaa ttctaaacct tactgctcct ttaccaggaa 300
catgacacac tatttanct cagttgcata cctcgccaat agtataattc aactgtcttg 360
cccgaacaat catctccatc tggaagacgt aagcctttag aaacacattt ttctattaat 420
ttctctagaa c 431
```

<210> 116
<211> 421
<212> DNA
<213> Homo sapien

```
<400> 116
gtcgcggccg aggtccagaa atgaagaaga agtttgcaga tgtatttgca aagaagacga 60
aggcagagtg gtgtcaaate tttgacggca cagatgcctg tgtgactccg gttctgactt 120
ttgaggaggc tgttcacat gatcacaaca aggaaccggg gctcgtttat caccagttag 180
gagcaggacg tgagcccccg ccctgcacct ctgctgttaa acacccagc catcccttct 240
ttcaaaaggg atcctttcat aggagaacac actgaggaga tacttgaaga atttggattc 300
agcccgcgaa gagatttatc aagcttaact cagataaaat cattgaaagt aataaggtaa 360
aagctaagtc tctaacttcc aggccacagg ctcaagtga ttcgaatac tgcatttaca 420
g 421
```

<210> 117
 <211> 489
 <212> DNA
 <213> Homo sapien

<400> 117
 agcgtggtcg cgcccgaggt aaggctgcga ggttgtggtg tctgggaaac tccgaggaca 60
 gagggctaaa tccatgaagt ttgtggatgg cctgatgac cacagcggag accctgttaa 120
 ctactacgtt gacactgctg tgcgccacgt gttgctcaga cagggtgtgc tgggcatcaa 180
 ggtgaagatc atgctgccct gggacccaac tggtaagatt ggccctaaga agcccctgcc 240
 tgaccacgtg agcattgtgg aacccaaaga tgagatactg cccaccaccc ccattctcaga 300
 acagaagggg gggaagccag agccgcctgc catgccccag ccagtcccca cagcataaca 360
 gggctctcctt ggcagacctg cccggggcggc cgctcgaaag cccgaattcc agcacactgg 420
 cggccggttac tagtggatcc cagctcggta ccaagcttgg cgtaatcatg gtcatactg 480
 gtttctctgt 489

<210> 118
 <211> 489
 <212> DNA
 <213> Homo sapien

<400> 118
 tcgagcggcc gcccgggcag gtattgaata cagcaaaatt ctatatacaa agtgacctgg 60
 acctgctgct tcaaaacatg atcctttctt actaatatct tgatagtcgg tccatagagc 120
 attagaaagc aattgactct taaataaaca gaaaagtgcc taatgcacat taaatgaatg 180
 gcctaactac tggaacttta gtagttctat aaggtagtta acataggtag gatccagttc 240
 ctatgacagg ctgctgaaga acagatatga gcatcaagag gccattttgt gcatgcccac 300
 cgtgatgccca tcgtgtttct ggatcataat gttcccatata tctgattcta gacacaccac 360
 aggaatatca gtggggctcag aggttagctt agctgcttgc tgggctagaa cagatatcac 420
 tccagcatgc tcatctgaca gggccccgcg gcaaccacaga ttaagtcctt gtgaatctgt 480
 gcacaggga 489

<210> 119
 <211> 181
 <212> DNA
 <213> Homo sapien

<400> 119
 taggttccag agacttttgg cccaggagga atatttactt ttagctctgg acatcattac 60
 aaaaagggaat atttcccaa cctcttcaga ccgagaatac atgggtaaaa ttattaaata 120
 gttgtataat aaaaataatt ttttccttaa aaaaaaaaaa aacctcggcc gcgaccacgc 180
 t 181

<210> 120
 <211> 489
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(489)
 <223> n = A,T,C or G

<400> 120
 gcgtgggtcgc ggccgaggtc catttaaaac aaagaaaaat actaaagcca ctagtaaaca 60

```

tctgatgtgc aaaatacaac atcctctagt tggctttatg ccattattac ataagctcca 120
aatagctcat cttaaattaa aaagaaaaag tggctgtccc atctctgctg cataaatcag 180
atTTTTTTTT aaaggTTtag agtactTTaa ggaagggaag ttcaaaactg ccagtgaat 240
tcacagagaa tacaaattta gcaatttaat ttcccaaagc tctttgaaga agcaagagag 300
tctctcttct taatgcagtg tcttcccaag aggaactgta attttgcttg gtacttatgc 360
tgggagatat gcaaaatgtg tttttcaatg tttgctagaa tataatgggt cctcttcagt 420
gnctgggtca tcctggaact catgggttaa gaaggacttc ttggagccga actgcccggg 480
cgggccttt

```

<210> 121
 <211> 531
 <212> DNA
 <213> Homo sapien

```

<400> 121
cgagcggccg cccgggcagg tggccagcgc tggccccgca gacgccgaga tggaggaaat 60
atTTgatgat gcgtcacctg gaaagcaaaa ggaaatccaa gaaccagatc ctacctatga 120
agaaaaaatg caaactgacc gggcaaatag attcgagtat ttattaaagc agacagaact 180
ttttgcacat ttatttcaac ctgctgctca gaagactcca acttcacctt tgaagatgaa 240
accaggggcg ccacgaataa aaaaagatga gaagcagaac ttactatccg ttggcgatta 300
ccgacaccgt agaacagagc aagaggagga tgaagagcta ttaacagaaa gctccaaagc 360
aaccaatgtt tgcactcgat ttgaagactc tccatcgat gtaaaatggg gtaaactgag 420
agattatcag gtcccagga ttaaactggc tcatttcttt gtatgagaat ggcataatg 480
gtatccttgc agatgaaatg ggcctaggaa agactcttca acaatttctc t 531

```

<210> 122
 <211> 174
 <212> DNA
 <213> Homo sapien

```

<400> 122
tcgagcggcc gcccgggcag gtctgccaac agcagaggcg gggcctccgg catcttcaaa 60
gcacctctga gcaggctcca gccctctggc tgcgggaggg gtctgggggtc tctctgagc 120
tcggcagcaa agcagatgtt atttctctcc cgcgacctcg gccgcgacca cgct 174

```

<210> 123
 <211> 531
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(531)
 <223> n = A,T,C or G

```

<400> 123
agcgtggtcg cgcccgaggt cctcaaccaa gagggttgat ggccctccagt caagaaactg 60
tggctcatgc cagcagagct ctctcctcgt ccagcaggcg ccattgcaagg gcaggctaaa 120
agacctccag tgcattcaaca tccatctagc anagagaaaa ggggcactga agcagctatg 180
tctgccaggg gctaggggct cccttgcaaga cagcaatgct acaataaagg acacagaaat 240
gggggagggt ggggaagccc tatttttata acaaagtcaa acagatctgt gccgttcatt 300
ccccagaca cacaagtaga aaaaaaccaa tgcttggtgt ttctgccaaag atggaatatt 360
cctccttctt aanttccaca catggccggt tgcattgctc gacagcattg cactgggctg 420
cttgtctctg tgggtctggc accagtagct tgggccccat atacacttct cagttcccac 480
anggcttatg gccnangggc angctccaat tttcaagcac cacgaaggaa g 531

```

<210> 124
<211> 416
<212> DNA
<213> Homo sapien

<400> 124
tcgagcggcc gcccgggcag gtccatctat actttctaga gcagtaaatc tcataaattc 60
acttaccaag cccaggaata atgactttta aagccttgaa tatcaactaa gacaaattat 120
gccaatcttg atttctcaca tatacttaga ttacacaaag ataaagcttt agatgtgac 180
attgtttaat gtagacttat ctttaaagtt ttttaattaaa aactacagaa gggagtaaac 240
agcaagccaa atgatttaac caaatgattt aagagtaaaa ctactcaga aagcattata 300
cgtaactaaa tatacatgag catgattata tacatacatg aaactgcaat tttatggcat 360
tctaagtaac tcatttaagt acatttttgg catttaaaca aagatcaaat caagct 416

<210> 125
<211> 199
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(199)
<223> n = A,T,C or G

<400> 125
agcgtggtcg cgcccgaggt gctttttttt tttttttttt tttttttttt gctattctaa 60
aggggaaggc ccctttttat taaacttgta cattttactt tccttctttc anaatgctaa 120
taaaaaactt ttgtttatag ttaaaaaaac cataaatcan acaaacaaaa gaaacgattc 180
caacatcact tctgngatg 199

<210> 126
<211> 490
<212> DNA
<213> Homo sapien

<400> 126
cgtggtcgcg gccgaggtcc agttgctcta agtggattgg atatggttgg agtggcacag 60
actggatctg ggaaacatt gtcttatttg cttcctgcc a ttgtccacat caatcatcag 120
ccattcctag agagaggcga tgggcctatt tgtttggtgc tggcaccaac tcgggaactg 180
gccaacagg tgcagcaagt agctgctgaa tattgtagag catgtcgctt gaagtctact 240
tgtatctacg gtggtgctcc taagggaacca caaatacgtg atttggagag aggtgtggaa 300
atctgtattg caacacctgg aagactgatt gacttttttag agtgtggaaa aaccaatctg 360
agaagaacaa cctaccttgt ccttgatgaa gcagatagaa tgcttgatat gggctttgaa 420
cccaaataa ggaagattgt ggatcaaata agacctgata ggcaaaactct aatgtggagt 480
gcgacttggc 490

<210> 127
<211> 490
<212> DNA
<213> Homo sapien

<400> 127
cgtggtcgcg gccgaggtcg gccgaggtct ggagatctga gaacgggcag actgcctcct 60
caagtgggtc cctgaccctt gacccccgag cagcctaact gggaggcacc cccagcagg 120


```

ggcacactga caccctcacac ggcaggggtat tccaacagac ctgaagctga gggctcctgtc 180
tgtragaagg aaaactaaca agcagaaagg acagccacat caaaaaccca tctgtacatc 240
accatcatca aagaccaaaa gtaataaaaa ccacaaagat gggaaaaaaa cagaacagaa 300
aaactggaaa ctctaaaaag cagagcacct ctctctctcc aaaggaacgc agttcctcac 360
cagcaatgga acaaagctgg atggagaatg actttgacga gctgagaaaa gaacgcttca 420
gacgatcaaa ttactctgag ctacgggagg acattcaaac caaaggcaaa gaagttgaaa 480
actttgaaaa 490

```

```

<210> 128
<211> 469
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(469)
<223> n = A,T,C or G

```

```

<400> 128
cgtggctcgc gccgaggtgc tttttttttt tttttttttt tttttttttt tgctgattta 60
ttttttctnt ttattgttac atacaatgta taaacacata aaacanaaaa cagtagggat 120
cctctaggat ctctagggan acagtaaagt anaaagaggt ctcanaaaca ttttttttaa 180
gtacaagaca ttcagngctc ggcccaaagg cgtaaaagggt ttanagccag canatagctg 240
nactaaaggc tccgtctntn tccccanagc caggacaacc ccagggagct ntccattagc 300
agccagtcca cgcaggcagg atgctgcgga aaaagctcta tgctganaac attccccctg 360
atggaaagaa gggcaacaca aaaggggtaa ctaanagctc cttcctctcg tgagggcgac 420
aactgaggaa cagaaaaagga gtgtcccatg tcacttttga ccccctccc 469

```

```

<210> 129
<211> 419
<212> DNA
<213> Homo sapien

```

```

<400> 129
gcgtggctgc ggccgaggtc tgattttcat ttaaattatt cagagctata gcatttgcct 60
ccatgctcaa atccacacca ttggggctta agccgctcat gccaacatta gcaaatagaca 120
tgcagtttaa tccagagatc actgcttctg ggctgatgca tgccaacaca ctggcgatgat 180
ccacgttatg tgcatttttc ttcacttttag tgggagaatc aatttttact ccaaggcttc 240
ttagttgctt aagagttgca ttaaggacac aatctttgtc caccagtctt gaatgatgtg 300
tttttttctt tgtatggtaa acgttttggg ttctgggtgca ttcagtactg ataattactg 360
ctttggtaga cggctgctca agtttccttg gaggaactat ttaataggtg ggttacttg 419

```

```

<210> 130
<211> 354
<212> DNA
<213> Homo sapien

```

```

<400> 130
agcgtggctc cgccgaggtt ccatctgagg agataaccac atcactaaca aagtgggagt 60
gaccccgagc agcacgctgt ggaattccat agttggtctc atccctgggc agtttccaca 120
tgatgatggt cttatctcga gaggcggaga ggatcatgtc cgggaactgc ggggtagtag 180
cgatctgggt taccagccg ttgtggccct tgaggggtgc acgaagggc atctgctcag 240
tcatggcggc ggcgagagcg tgtgtcgtg cagcgacgag gatggcactg gatggcttag 300
agaaactagc accacaacct ctctgcccgc acctgcccgc gcggcccgct cgaa 354

```

<210> 131
 <211> 474
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(474)
 <223> n = A,T,C or G

<400> 131
 cgagcggccg cccgggcagg tctggcagca gcttcctctg gaataattga cagctttgtg 60
 ctgcctgact aaaatttgaa atgacaaccg ctgaatgtaa aatgatgtac ctacaatgag 120
 agagatttag gaatactatc tgtcaatcca tagatgtaga aacaaaaaaa actacagaat 180
 gaaaacaaac ttattttaaa ccaaagaaac aaatgtatcc aaaatatagt ccatgatata 240
 tttgattact agtataacca cagttgaaaa cttaaaaaaa aaaattgaca ttttttgtaa 300
 tgggtactaa tggatttata aaaggtttct gtttcctaaag atgttattgg ggtccacata 360
 ttccttgaag acttcagcat cccaaagccc gacatcagag atactttcct ttagccattg 420
 nttcccgtaa cttgcccact ccatgggtgat gtgacaggct tcccttcatt agca 474

<210> 132
 <211> 474
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(474)
 <223> n = A,T,C or G

<400> 132
 ggccgaggtg ggggaattcat gtggaggtca gagtgggaagc aggtgtgaga ggggtccagca 60
 gaaggaacaa tggctgccaa agtggtttgag tccattggca agtttggcct ggccttagct 120
 gttgcaggag gcgtggtgaa ctctgcctta tataatgtgg atgctgggca cagagctgtc 180
 atctttgacc gattccgtgg agtgcaggac attgtggtag ggggaaggac tcattttctc 240
 atcccgtggg tacagaaacc aattatcttt gactgccgtt ctcgaccacg taatgtgcca 300
 gtcatactg gtacgaaaga ttacagaat gtcaacatca cactgcgcat cctcttccgg 360
 cctgtcgcca gccagcttcc tcgcatcttc accagcatcg ganaggacta tgatgaaccg 420
 tgtgctgccg tccatcacia ctgagatcct caagtcagtg gtggctcgct ttga 474

<210> 133
 <211> 387
 <212> DNA
 <213> Homo sapien

<400> 133
 tgctcgagcg gccgccagtg tgatggatat ctgcagaatt cggcttagcg tggctcgccg 60
 cgaggtctgc gggcccctta gcctgccctg cttccaagcg acggccatcc cagtagggga 120
 ctttcccaca ctgtgccttt acgatcagcg tgacagagta gaagctggag tgcctcacca 180
 cacggcccg aaacagcggg aagtaactgg aaagagcttt aggacagctt agatgccgag 240
 tgggcgaatg ccagaccaat gatacccaga gctacctgcc gccaaacttg tgagatgtgt 300
 gtttgactgt gagagagtgt gtgtttgtgt gtgtgttttg ccatgaactg tggccccagt 360
 gtatagtgtt tcagtggggg agaactg 387

<210> 134

<211> 401
 <212> DNA
 <213> Homo sapien

<400> 134
 ggccgcccgg gcaggtctga tgaagaacac ggtgtgatc cttgccaatg acgccaatgc 60
 tgagcggtctc aagagtgttg tgggcaactt gcatcggtg ggagtcacca acaccattat 120
 cagccactat gatgggcgcc agttcccca ggtggtggg ggctttgacc gactactgct 180
 ggatgctccc tgcagtggca ctggggtcat ctccaaggat ccagccgtga agactaacia 240
 ggatgagaag gacatcctgc gcttgtgctc acctccagaa ggaagtgtct cctgagtgtc 300
 attgactctt gtcaatgcga ccttcaagac aggaggctac ctgggtttact gcacctgttc 360
 tatcacagtg agacctctgc catggcagaa caggggaagc t 401

<210> 135
 <211> 451
 <212> DNA
 <213> Homo sapien

<400> 135
 ggtcgcggcc gaggtctgtt cctgagaaca gcctgcattg gaatctacag agaggacaac 60
 taatgtgagt gaggaagtga ctgtatgttg actgtggaga aagtaagtca cgtgggccct 120
 tgaggacctg gactgggtta ggaacagtgt tactttcaga ggtgaggtgt cgagaagggg 180
 aagtgaatgt ggtctggagt gtgtccttgg ccttggtctc acaggggtgt ctttctctg 240
 gggccgtcag ggagctcatc ccttgtgttc tgccagggtg gggtagcggg gtttgacact 300
 gaggagggta acctgctggc tggagcggca gaacagtggc cttgatttgt cttttggaag 360
 attttaaaaa ccaaaaagca taaacattct ggtccttcac aatgctttct ctgaagaaat 420
 acctaacgga aggacttctc cattcaccat t 451

<210> 136
 <211> 411
 <212> DNA
 <213> Homo sapien

<400> 136
 ggccgcccgg gcaggtctga atcacgtaga atttgaagat caagatgatg aagccagagt 60
 tcagtatgag ggttttcgac ctgggatgta tgtccgcgtt gagattgaaa atgttcctg 120
 tgaatttgtg cagaactttg acccccttta cccattatc ctgggtggct tgggcaacag 180
 tgagggaaat gttggacatg tgcagggtggg tccctttgct gcgtatttgg tgcctgaggc 240
 tctgtggatt tcccctccat caatcatctt accctctcat cccctcaga tgcgtctgaa 300
 gaaacatctc tgggtataaga aaatcctcaa gtcccaagat ccaatcatat tttctgtagg 360
 gtggagggaag tttcagacca tcctgctcta ttatatccga agaccacaat g 411

<210> 137
 <211> 211
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(211)
 <223> n = A,T,C or G

<400> 137
 cggccgcccgg ggcaggtcgg ttggtgcggc ctccattgtt cgtgttttaa ggcgccatga 60
 ggggtgacag aggcctgtgt cgtggtgggc gctttggttc cagaggaggc ccaggaggag 120

ggttcaggcc ctttgcacca catatcccat ttgacttcta tttgtgtgaa atggcctttc 180
cccgntcaa gccagcacct cgatgaaact t 211

<210> 138
<211> 471
<212> DNA
<213> Homo sapien

<400> 138
gccgcccggg caggtctggg ctggcgactg gcatccagge cgtaactgca aatctatgct 60
aggcgggggtc tcccttctgt gtgttcaagt gttctcgact tggattctta actattttta 120
aaaatgcact gagtttgggt taaaaaccaa ccacaaaat ggatttcaac acagctctaa 180
agccaagggtc gtggcgggt ctcccaacac agcgactcct ggaggccagg tgcccatggg 240
cctacatccc ctctcagcac tgaacagtga gttgattttt ctttttacia taaaaaaagc 300
tgagtaatat tgcataggag taccaagaaa ctgcctcatt ggaaacaaaa actatttaca 360
ttaaataaaa agcctggccg caggctgcgt ctgccacatt tacagcacgg tgcgatgcac 420
acggtgacca aaccacggag gcaagcttct ggcactcaca ccacgacctg c 471

<210> 139
<211> 481
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(481)
<223> n = A,T,C or G

<400> 139
gtcgcggccg aggtctgttc tttagctcag atttaaacct gctgtctctt ctttatttgc 60
agaatgaatt cccagttcct gagcagttca agacctatg gaacggggcag aagttggtea 120
ccacagtgc agaaattgct ggataagcga agtgccactg ggttctttgc cctcccttca 180
caccatggga taaatctgta tcaagacgggt tcttttctag atttctctta cctttttgct 240
cttaaaaactg cttctctgct ctgagaagca cagctacctg ccttcaactga aatataacctc 300
aggctgaaat ttgggggtggg atagcaggtc agttgatctt ctgcaggaag gtgcagcttt 360
tccatatcag ctcaaccacg ccgncagtcc attcttaagg aactgccgac taggactgat 420
gatgcatttt agcttttgag cttttggggg gtattctacc aaccaacagt ccatttgga 480
a 481

<210> 140
<211> 421
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(421)
<223> n = A,T,C or G

<400> 140
gtcgcggccg aggtttccca ttttaagaaa atagatcttg agattctgat tcttttccaa 60
acagtcacct gctttcatgt acagcttttt ctttacctta cccaaaattc tggccttgaa 120
gcagttttcc tctatggctt tgcctttctg attttctcag aggtctcgagt ctttaataata 180
accccaaatg aaagaaccaa ggggaggggt gggatggcac ttttttttgt tggctctgtt 240
ttgttttgtt ttttgggttg ttgggttccg ttatttttta agattagcca tctctctgctg 300

41

ctatttcctt acataatgtc aatttttaac cataattttg acatgattga gatgtacttg 360
 aggttttttt gntttaattg agaaaagact ttgcaatttt ttttttagga tgagcctctc 420
 c 421

<210> 141

<211> 242

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(242)

<223> n = A,T,C or G

<400> 141

cgantngccc gcccgggcan gtctgtctaa nttntcang gaccacgaac agaaactcgt 60
 gcttcaccga anaacaatat cttaaaccac gaanaattta aatattatga aaaaaaacat 120
 tgcaaaatat aaaataaata nnaaaaggaa aggaaacttt gaaccttatg taccgagcaa 180
 atccaggtct agcaaacagt gctagtccca nattacttga tntacaaca cecatgaata 240
 ca 242

<210> 142

<211> 551

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(551)

<223> n = A,T,C or G

<400> 142

agcgtggctg cggcncgang tccacagggc anatattctt ttagtgtctg gaattaaaat 60
 gtttgagggt tangtttgcc attgtctttc caaaaggcca aataattcan atgtaaccac 120
 accaagtgc aacctgtgct ttctatttca cgtactgttg tccatacagt tctaaatata 180
 tgtgcagggg attgtagcta atgcattaca cagtcgttca gtcttctctg cagacacact 240
 aagtgatcat accaacgtgt tatacactca actagaanat aataagcttt aatctgaggg 300
 caagtacagt cctgacaaaa gggcaagttt gcataataga tcttcgatca attctctctc 360
 caaggggccc gcaactaggc tattattcat aaaacacaac tgaanagggg attggtttta 420
 ctggtaaatc atgtgntgct aaatcatttt ctgaacagtg gggctctaat cantcattga 480
 tttagtggca gccacctgcc cggcgccgn tcgaagccca attctgcaga tatccatcac 540
 actggcggcc g 551

<210> 143

<211> 515

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(515)

<223> n = A,T,C or G

<400> 143

cgagngggccc gcccgggcag gtatcttcac aaactcaaca aaggcactac atgagacttc 60

```

acattccccct agtccaatag ctgacaaatt tttgcaacgt tctgcaatgc gaattaactc 120
ttcatcaagt ggccgtaatc catttgacac cactactagt tcaaccagtc tagggcatgc 180
cattcccaca cggccaagca catctttgct tactgatctc ccaaagtaca gatgggtggc 240
agggtatttca tagcgaaaga aggggtcaaa ttcttcttca tataanaaaa aatacatcac 300
taagttcact ttgggtgaat gtctgatgaa agcatcccag ctactcttct gaatagtatg 360
gaagtgtgtc tgtccaggat tctcactgac tacatcaatg cgcaaagtgt ctaatcgaac 420
atgtttttca gaagacaatg caagtaacaa ctcactactc aataagtggg aagttcaggg 480
ctagtctctt taagccngga cactgatcag cacac 515

```

```

<210> 144
<211> 247
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1) ... (247)
<223> n = A,T,C or G

```

```

<400> 144
tgcattctct ntggatgcan acctgcccgt tggtagggac tntgctcaca cggaacatgg 60
acggttacac ctgtgcccgtg ggtgacgtcc accagcttct ggatcatctc ggcgnggggtg 120
ttgtggaagg gcagactatc cacctccatg cncacgatgc ccganacgcc actccggact 180
ntgtgctgca ccaanatgcc cagcattnta tcttcaagca nagcacttat cagggtcctt 240
ggcacac 247

```

```

<210> 145
<211> 309
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1) ... (309)
<223> n = A,T,C or G

```

```

<400> 145
cgtgggtcgc ggcccangt ctgctgtaac aaaacaccat agtctgggca gctcatagac 60
aatggaattt tatttctcac gcttctggag gctggattcc aagatcaagg ttccaggaga 120
ctcagtgtct ggcaaggctc cggtttctgc ctcanagatg gtgccatctg gctgtgtcct 180
cacaagtagg aaggtgcaag aagctcccct caggctctgt ctgtaagaca ctgatcccat 240
tcatganggg gaaacgtaat gacctaatca gccccagag accccacttc taacaccatc 300
accttgggg 309

```

```

<210> 146
<211> 486
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1) ... (486)
<223> n = A,T,C or G

```

```

<400> 146

```

```

agcgtgggtc ggggncgac gtcctgtcca tatttcacag cccgagaact aatacaagat      60
gctgacatca tattttgtcc ctacaactat cttctanatg cacaaataag ggaaagtatg      120
gatttaaate tgaaagaaca ggttgtcatt ttanatgaag ctcataacat cgaggactgt      180
gctcgggaat cagcaagtta cagtgtaca gaagttcagc ttcggtttgc tcgggatgaa      240
ctanatagta tgggtcaaca taatataagg aaganagatc atgaaccctc acgagctgtg      300
tgctgtagcc tcattaattg gntagaagca aacgctgaat atcttgnana angagantat      360
gaatcagctt gtaaaatatg gagtggaat gaaatgctct taactttaca caaaatgggt      420
atcaccactg ctacttttcc cttttgcng gtaagatatn ttttctacct gngaaacgta      480
ttaaag
486

```

<210> 147

<211> 430

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(430)

<223> n = A,T,C or G

<400> 147

```

gccgcccggg cangttcgac attacntnga gttccatgat gtacaattct ttcacgaaaa      60
acaatgaatg caagaatttg aggatctcct tactcctccc ttttacagat ggtctctcaa      120
tcccttcttc ttctcttcca tcttcattct cttctgaacg cgctgccggg taccacggct      180
ttctttgtct ttatcgtgag atgaagggtga tgcttctgtt tcttctacca taactgaaga      240
aatttcgctg caagtctctt gactggctgt ttctccgact tcgcctttnt gtcaaacgng      300
agtcttttta cctcatgccc ctccagcttca cagcatcttc atctggatgt tnatttctca      360
aagggtcac tgaggaaact tctgattcan atgtcgaana gcactgtgaa gttttctctt      420
cattttgctg
430

```

<210> 148

<211> 483

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(483)

<223> n = A,T,C or G

<400> 148

```

cccgggcagg tctgtgttgn tttncaccg gtgtcctccc cagcgtccag aananggaaa      60
tgtggagcgg gtgatgatga cccctcgctg tctgtcacc tctgcacag cttcgtatgt      120
gggtctggtc tgggaccacc cgtacaggtt gtgcacgttg tagtgctcca cgggggagct      180
gtccggcagg atctgctgac tctccatgca cagagtcttg ctgctcaggc ccttgtccct      240
agattccaaa tatggcatat aggggtgggt tatttagcat ttcatgtctg cagccctga      300
cagatccatc cacaaaattt gatggctcat tcatatcaat ccacaatcca tcaaacttca      360
agctcttctc tggntctcga nggtttgcat agaactcttc tatctctttc ttccaccacg      420
canacctcgg ncgcgaccac gctaagccga attctgcana tatccatcac actggcgggc      480
gct
483

```

<210> 149

<211> 439

<212> DNA

<213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(439)
 <223> n = A,T,C or G

<400> 149
 ctttcacgaa nacaatgaat gcaagaattt gaggatctcc ttactcctcc cttttacaga 60
 tggctctctca atcccttctt cttcctcttc atcttcatct tcttctgaac gcgctgccg 120
 gtaccacggc tttctttgtc tttatcgtga gatgaagggt atgcttctgt ttcttctacc 180
 ataactgaag aaatttcgct gcaagtctct tgactggctg tttctccgac ttgcctttt 240
 tgcaaacgtg agtcttttta cctcatgccc ctcagcttcc acagcatctt catctggatg 300
 ttcatctctc aaagggtcct ctgaggaaac tttgactcga catgtcgaag aagcactgng 360
 agtttctctt catttgctgc aaanttgctc tttgctggct gngctctcag accaccatt 420
 tggctgcatg ggggctgac 439

<210> 150
 <211> 578
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(578)
 <223> n = A,T,C or G

<400> 150
 ggcncgcccc ggcangtcca ctccactttt gagctctgag ggaatacctt caggagggac 60
 agggtcaggg agtcctggca gctccgcagc agagattcac attcattcag agacttggtg 120
 tccagtgcga tgccattgat cgcaacgacg ctgtctccca cagcaaggga cccttcttta 180
 gcggcagggc ttccaggcag cacagcgcca gcatacactc cattctccag actgatgcca 240
 ctgtctttct gtccactgan gttgatgtgc agcggcgtga ccaccttccc acccagggac 300
 ttctctcgcc gcacgaccat gttgatgggc cccctnccca ttgaggagcg ccttgatggc 360
 ctgcttcttg nccttggtga tgaagtccac atcggtgatt ctcacagcca gtcattgacc 420
 cttaagcggg catcagcaat gcttcttttg gccactttag ngacaaatat gccacagtc 480
 ccgggaaaca agggtcattc acaccttctg gcatatcaaa cacctcggcc gggancacta 540
 agccgaattc tgcagatata catcacactg gngggccc 578

<210> 151
 <211> 503
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(503)
 <223> n = A,T,C or G

<400> 151
 cgagcggccc gcccgggcag gtctgggaga tcagcgactg ctgccacgtg cccagaaatg 60
 gctcgtcctt tcactacagc ggaatgcaat gagggtgggt gagaagatga tgggtcgggt 120
 atttcattcc ttttcttttt acaacttcac ttctagagac ttcagcgttc catgtctgct 180
 gtgctgtgga acccagagtg ctcttgccctg gatggctgag aatcccttg accctggaag 240
 cacctactcc atgatggccc ggtatagtgc aggtcaata taatcttccc ggtatcttga 300
 gttgataact cgttgccgtt tctttctctg cttaacctct ttctctgtga aaatctcatt 360


```

gaagcgcatg tctgaagcta ctgacagtct anatttgact ctcttgggaa gctcttcac 420
cagtgtgatat acatcatctc tcttaaccac aagttggagc catncttaaa cttcacctgg 480
tacatttggga tagggtggga ggc 503

```

<210> 152

<211> 553

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(553)

<223> n = A,T,C or G

<400> 152

```

agcgtggtcg cggcccggagg tccactgagc tccgccttcc ccgggctccc tgaggaagca 60
gagtcctgac ttccaggaag gacaggacac agaggcaaga actcagcctg tgaggctctg 120
ggtggctcct gaggccagag gacgccttcc gcgatccatg gctcagcatc gtccttcttg 180
cttcccagcc ccgggccgaa cggtcgggtt aataagcaga gcagtatttc ggctcctggc 240
aggagctccc ccgttagttt ccacgttggt agcacattca tacttaagac tgnntctctt 300
tgtgttttaa gcgtctgtct ctgtagtaaa ctgaaatgtt aacagaaatg cagacctgcc 360
cgggcccggc ctcgaaagcc gaattctgca gatatccatc aactggcgg cgcctcgagc 420
atgcatctag anggcccaat tcgccctata gtgagtcgna ttacaattca ctgggccggc 480
ntttacaacg tcgtgactgg gaaaaccctg cggtagccac ttaatcgctt tgcagnacat 540
ccccctttcg cca 553

```

<210> 153

<211> 454

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(454)

<223> n = A,T,C or G

<400> 153

```

tcgagcggct cgcccgggca ggtccaccta gcatggctcc tctaaacacg caactcagcg 60
aggggacccc cttcacctct ggcaagagag ctgggtagat cagaaacttg gtgacacctg 120
gctagcacag agcaggctca cttgtcttgg tcccactacc cagattcctg cagacattgc 180
aaaccaaata aagggttgntg aatgaccctt gtcccagcc acttggtttg gtatcatctg 240
ctctgcagtg gaatgcctgt gtgtttgagt tcaactctgca tctgtatatt tgagtataga 300
aaccgantca agtgatctgt gcatncagac aactggggc acctgancac agaacaaatc 360
accttaacga tctggaatga aactgnganc antgcccgc tgggtgggtc tgganaaact 420
gccgncttct tgttggacct tggccgcacc acct 454

```

<210> 154

<211> 596

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(596)

<223> n = A,T,C or G

```

<400> 154
agcgtggtcg cggcccgang gcgccctcct gantganggg aagggacgtg ggggcggcca      60
cggcaggatt aacctccatt tcagctaata atgggagaga ttaaagtctc tcctgattat      120
aactggttta naggtacagt tccccctaaa aagattattg tggatgatga tgacagtaag      180
atatggtcgc tctatgacgc gggcccccga agtatcaggt gtcctctcat attcctgccc      240
cctgtcagtg gaactgcaga tgtctttttc cggcagattt tggctctgac tggatggggg      300
taccgggtta tcgcttttga gtatccagtt tattgggacc atctcgagtt cttgtgatgg      360
attcacaaaa cttttanacc atttacaatt ggataaagtt catctttttg gcgcttcttt      420
gggangcttt ttggccana aatttgctga atacactcac aaatctccta gaagccattc      480
cctaactcct tgcaattcct tcagngacac ctctatcttc aaccaacttg gactggaaac      540
agctttggct gatgcctgca tttatgctca aaaaatagtt cttggaaatt ttcac      596

```

```

<210> 155
<211> 343
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(343)
<223> n = A,T,C or G

```

```

<400> 155
ctcganttgg cncgcccggg cangtctgcc tggtttttga ccgngcgagc tatttagnct      60
ctggctctgt ttccggagct caaggnaaaa atcttgaana actcgagcag cttctgtgga      120
tagccttggg tacacatact gccgagcata gccaatgtac tttctcaata gctgggtggg      180
aatgggatct attgtttctc caggaaccac ctttagtctt tctgataatg gcttctcaga      240
aactacttca agtacggaag tatttgaatc ttgactatnc atacgagcta ctgtggcact      300
gctaattggg tctctgctnt ccagctctta ttgcaatcac atg      343

```

```

<210> 156
<211> 556
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(556)
<223> n = A,T,C or G

```

```

<400> 156
tcgagcggcc cgcccgggca ggtctggcac cacncagatc gattaactgg ctcatctgat      60
ctcgtggccc ccaccctgga actgacttag cacaaaagga cactcaatt cttatgatt      120
tcctctccga cccaaccaat caacaccctt gactcactgg cttccccct cccaccaaatt      180
tatccttaaa aactctgata cccgaatgct cagggagatc gatttgagta ctaataagac      240
tccagtctcc tgcacaagca gctctgtgta ctcttctct attgcaattc ctgtcttgat      300
aaatcggctc tgtgtaggcg gcggaagaag tgaacctgtt gggcgggtac cactctgtc      360
gtgtgtgaca gttgntttga atctctaatt gctcagtaca gatccacatg caggttaagt      420
aagaagcttt tgaagaaaat ggaaagtctt aagtgatggc ttccaagaaa tcaaacctac      480
attaattagg gaacaacgga ctttacgtat cacaaatgaa gagactgacn aagtaaatca      540
acttggcctt ttctta

```

```

<210> 157
<211> 333

```

<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(333)
<223> n = A,T,C or G

<400> 157
ggccccacaaa aatatatnaa ataagctgga tatataaaan caaacactta acatngnncan 60
cattccttca gttattcaaa ctctactgata nctaacnggg agnagttggn attctggaag 120
acttcctaag ctaaaagtat atttacatat ttacaacaca ngtaaatata acngaagaac 180
tacttcaa at aangnngaaa ttccagaatt ctanagattt atagctatag ntnacaanta 240
tcaccaattg gtttgcaatc aanngnccag cactacttat gannaangtt taactannaa 300
accaaaaagg gagaaaacct ggnagggaaa nat 333

<210> 158
<211> 629
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(629)
<223> n = A,T,C or G

<400> 158
tcgagcggcc gcccgggcag gtctggtaca tttgtgcgag gtccggcact ctgtttctcat 60
ccagtaagtg gtcgagccct ttctgcagaa ttgctgttaa atgttctcct aatagctgtt 120
tctccacaca agcaatcagt ggtttctgtg tgctgtggtc caagtaagtg attactctgt 180
ctccctcttc ttctaagcgt ttacttacat ggtaaagata ttctggaacc tctctttcct 240
gcattaacct ttggccttcg gcagcatata agcaattagt ctcttccaaa aatttcagtt 300
caaatgaatc ttatataacc tgcaggtcag acagcatgcc cagggnaggct ccgcaacagg 360
ctccgggtcca cggcctcgcc gctcctctcg cgctcgatca gcagtaggat tccatcaatg 420
gttttactct gaaccatttt atcactaata atatgggttc taaacagttc taatcccata 480
tcccagatgg agggcagcgt ggagttctgc agcacatagg tgcgggtcaa gaacaggaag 540
atgcttctga tcatgaatca tttgnctggc aatggctctg ccagcacgtg gtaatctttc 600
ttttaaaaat aaacccttat ctaaactgc 629

<210> 159
<211> 629
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(629)
<223> n = A,T,C or G

<400> 159
tcgagcggcc gcccgggcag gttctagagg ganaatctgg ctgatttggg aataaaatat 60
aatcgaatat tcaacacccat gaagataaat cttatttttg aaatctactg accttaatac 120
cccaagcttg ccctgaatac tttgattgga attggaatat atcaaaaaag gttagtattt 180
ttgtttagt taggatacta aaaggatatt agttacccaa gagatccaat ttgtttttct 240
gatgaatagt gttcagtaaa atgaagcagt cctaagagt actaataat tcaaagtgat 300

```

ttttcgtcctt ttcttaatat tttttaatta tttattttta agagttttat accttgagca 360
gatacaaatga tccgcttttag tgagaggaca atttctgatt gattgttttc ttttcaggcc 420
atctcacctc ttcattctct tggtacattt gaagcagttg atataatggg tttatacttt 480
aaaagataga catggtgccca tgaagtttgg ggaagttggg tgaattatcc cattctagtt 540
acagangagc tttccttaaa tgccctttac ttctangttt ggtcaagaag tcattttctg 600
agtaaaagtt attttcatat atgttgggg 629

```

<210> 160

<211> 519

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(519)

<223> n = A,T,C or G

<400> 160

```

tcgagcggcg cgcccgggca ggtctgctgg gattaatgcc aagttnttca gccataaggt 60
agcgaatct agcagaatcc agattacatc cacttccaat cagcggtgt ttgggtaatc 120
cacttagttt ccagataaca tacgtaagaa tgtccactgg gttggaacc acaattatga 180
tgcaatcagg actgtacttg acgatctgag gaataatgaa tttgaagaca ttaacatttc 240
tctgcaccag attgagccga ctctccctt ctgtgtgacg gactcctgca gttaccacta 300
caatcttana attgggcggg tcacagaata atctttatct gccacaattt taggtgctga 360
agaaataagc tcccatgctg cagatccatc atttctnctt taagcttatc ttccaaaaca 420
tccacaagan caangttcat cagccagaga ctttcccaga atgctgatag nacacgccat 480
accaacttgt ccaacancca ctacagcgat cttattgggt 519

```

<210> 161

<211> 446

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(446)

<223> n = A,T,C or G

<400> 161

```

cgagngggccc gcccgggcag gtccagtaag cntttnacga tgatgggaaa ggttatgcaa 60
ggteccagcg gtacaacgag ctgtttctac atcatttgta ttctgcatgg tacgtacaat 120
agcagacacc atctgaggag aacgcatgat agcgtgtctg gaagcttctt ttttagaaag 180
ctgatggacc ataactgcag ctttattaac caccacctgg tcctcgtcat ttagcagttt 240
tgtcagttca gggattgcac gtgtggcang ttctgcatca tcttgatagt taatcaagtt 300
tacaactggc atgtttcagc atctgcatg ggctcagcaa acgctggaca ttantgggat 360
gagcagcatc aaactgtgta natgggatct gcatgccctc atctaattgtc tcagggaaca 420
tagcagctcg taccctctga gctcga 446

```

<210> 162

<211> 354

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1) ... (354)

<223> n = A,T,C or G

<400> 162

agcgtngtcg	cgccccgang	tccctgggaag	cctttnttgc	tgagcctcac	agcctctgtc	60
aggcggtctg	ggatccagcg	gtccaccagg	ctctcatggc	ctccgggctg	ggagnggggt	120
gagggcacaa	aacccttccc	aaggccacga	anggcaaact	tggtggcatt	ccanagcttg	180
ttgcanaagt	ggcggnnaacc	cagtatccgg	ttcacatcca	ggntgatgtc	acgaccctgg	240
gacatgtang	cacataatcc	aaaccggaga	gcacgggtgc	cacattcacg	aatccccgct	300
gggaagtcag	ctttctgccc	ttctttggcc	ttctccacct	cgctgggac	cagg	354

<210> 163

<211> 258

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1) ... (258)

<223> n = A,T,C or G

<400> 163

tttttcncca	agtcctcttg	ccgnngggatc	tngactgcaa	tttaagacac	ttctaattag	60
ttatacccag	gccttgcaaa	attgctgggt	ttatataata	tattcttgct	gcacgaagat	120
ttattattct	gttgatgat	tctattttaa	ttntatttat	tctggccaaa	aaagaacctt	180
ctccgctcgt	caagagangc	caatntgtct	tgaaggacaa	gagaaagatg	ctaacacaca	240
ctttcttctt	cttgagga					258

<210> 164

<211> 282

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1) ... (282)

<223> n = A,T,C or G

<400> 164

ggaacatatt	actttttaat	tacttggtgc	aatgaaacat	ttaataaaaa	catttgcttc	60
tctatataat	acgtatgtat	aaaataagcc	ttttcanaaa	ctctggttct	cataatcctc	120
tataaatcan	atgatctgac	ttctaagagg	aacaaattac	agnaaggggt	atacattnat	180
gaatactggt	agtactagag	ganngacgct	aaaccactct	actaccactt	gcggaactct	240
cacagggtaa	atgacaaaagc	caatgactga	ctctaaaaac	aa		282

<210> 165

<211> 462

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1) ... (462)

<223> n = A,T,C or G

```

<400> 165
gccccgggcan gtcctgtaat cccagctact cangangetg agtcatgana atcgctgaa      60
tccggggaggt agaggccgca gcgagcaaag attaagccac tgcactccag tctgggtgac      120
agagtgagaa tctgtctgtt gtcctctctg cattgggtctg aaatgggttt gtagaacatg      180
ccacagaagg accagcanca gcaacaaatg gatttgtgga ancgtagct ccaaattggag      240
cangcacact tgatgaagca cgctgtgtct gtgcagangc aaccactggc actgttccaa      300
aaacattgct gctagcatta cttgtggaag tatacgcat actggagggt gctgcanaac      360
tgaaaacgct gtctagtctt gccanagctg catacttgnc tgaanatgca cttgactgac      420
tgggaactga accacanaac caacaggacc tttacctgtg ga                          462

```

<210> 166

<211> 365

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1) ... (365)

<223> n = A,T,C or G

```

<400> 166
cgtgggtcgc ggcncgangt ctgaaaccaa tccagaacta aacatcagca cacaaaaaat      60
accaggatag atggaatcaa aagactctga agccaaaagg aggctaggga gagcaactga      120
acttagcaag ctgaggactt cagtgtccat catccgatcc tgccctgtaa caacaggtct      180
atatgataga gatattccat ctgagctgga ggccattatc cttagcaaac taacacagaa      240
cagaaaacca aatacatgtt ctcatctaga agtaggagct aaatgatgag aactcaagga      300
cacaaaagaa ggaacaacag acactggggc ctacttgagg gtggagggtg ggaggaggga      360
gaaga                                              365

```

<210> 167

<211> 364

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1) ... (364)

<223> n = A,T,C or G

```

<400> 167
agcgtggtcg cggcgcgang tccagcccta gcttgccgtg gactccgect tcactgggtg      60
ctctctctaa aagttgctga ctctttactg tatctcccaa tccccactcc attggttcca      120
taaggggagg ggtgtctcac tcaacatggt gttcctggta ccaagaactg gctgacgaag      180
ctgggtgccg tggctcatgc ctgtaatccc agcacttttg ggaggccaag aagggcggat      240
cacctgaggt ctggagtcca agatcagcct gaccaacatg atgaaaccaa gtctccacta      300
aaaatataaa acaattagcc aggcattggt gtgggtgcct gnaatcccag ctactgggga      360
ngct                                              364

```

<210> 168

<211> 447

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1) ... (447)

<223> n = A,T,C or G

<400> 168

```
cccgggcagg tcaaaaccca aaacctttca ttttagccca aaccagctca tgattaggta      60
tacaaggata acagaaccag ttgtcaggac gagcatttga caagtaaaag caattcttgc      120
aaagctgcag ttcattccagc tcatggcatg tgtctttata tagcatcctc gcaatgtcag      180
cttgctcact gtctgctcca tagaaaatca cggatttgtg gagaagcaat tgggcatcag      240
ctttgaactc ttcataactt cggatattcc ctctattcac tttctcttga atgggtggaa      300
cgtccacaga cctcgccgcg gaccacgcta agcccgaatt ctgcagatat ccatcacact      360
ggcggccggt cgagcatggc atctagaagg cccaattcgc ctatagnagag tcgnattacc      420
aattcactgg ccgtcgnntt acaacgc
```

<210> 169

<211> 524

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1) ... (524)

<223> n = A,T,C or G

<400> 169

```
cgantngcgc gcccgggcag gtctgagcag cctttctggn tgctggacta ttgggattgg      60
gttcatccaa cagagactgt atggatgtta gaatggaaga cacatcatag gttggactcc      120
aacggttctg aagtatgtcc agacatatat taccatctgc atagactaag aacaaagaag      180
taggtacatt aaacgtaaca agaccactaa ggttttaaca ttatagacaa aacanaaata      240
gtcaaganta ctttgctttt gaagttaaaa gattcctatg ttgcttccca gttaactgcc      300
taaaaagata agncataacc accactagtg aaataatcan gatgatcaga gaatgtcana      360
tgtgatcagt ataaaactgg angatattna gtgtcatcct ttggaaaagg ctgcctatn      420
atccaggaaa tcanaaacat tnttgaacag ggnccctagc tatccacaga catgtgggaa      480
attcattccc caaatngtag gctggatccc ctatctgaaa taac
```

<210> 170

<211> 332

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1) ... (332)

<223> n = A,T,C or G

<400> 170

```
tcganccgcn cgcccgggca ggtgacaaac ctgttattga agatgttggg tctgatgagg      60
aanaanatca gaagggatgg tgacaagaan aanaanaaga agattaagga aaagtacatc      120
gatcaagaag agctcaacaa aacaaagccc atctggacca gaaatcccga cgatattact      180
aatgangagt acggagaatt ctataanagc ttgaccaatg actgggaaga tcacttggca      240
gtgaagcatt tttcagttga nggacagttg gaattcagag cccttctatn tgtcccacga      300
cgtgctcctt ttgatctggt tganancaga aa
```

<210> 171

<211> 334

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(334)

<223> n = A,T,C or G

<400> 171

cgagngggcnc gcccgggcag gtctgttgat agcgacttaa cagaaaagtc tagacaaaca	60
taagcataaa aaattacagt ctttctaccc ttgggaatgg ggagaaaaag gaatctctac	120
cccaagacca gaaataataa gtcctgtttc tggctctgaa catccagaat tatggaggct	180
ttggcctgac accacattan aatttggtct ggaaatcaaa ctttaganac angagatcgt	240
aagccatttt atactatcga cctaaattcc agtctaacgg ttcctttaca aagttgcgga	300
aagccctctt atatgctagc tgtaggaaat atag	334

<210> 172

<211> 439

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(439)

<223> n = A,T,C or G

<400> 172

agcgtgggtcg cggcccgang tctgcctata aaactagact tctgacgctg ggctccagct	60
tcattctcac aggtcatcat cctcatccgg gagagcagtt gtctgagcaa cctctaagtc	120
gtgctcatalc tgtgctgcca aagctgggtc catgacaact tctgggtggg cgagagcagg	180
catggcaaca aattccaagt tagggctctc aatgagcttc cttagcaagcc agaggaaagg	240
cttttcaaag ttgtagttac ttttggcaga aatgtcgtag tactgaagat tcttctttcg	300
gtggaagaca atggatttcg ccttcacttt ctgccttaat atccactttg gtgccacaca	360
acacaatggg gatgntttca cacacttngn accanatctc tatgccagnt aggccatttt	420
ggaagnactt cganggtac	439

<210> 173

<211> 599

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(599)

<223> n = A,T,C or G

<400> 173

cgatnnggccg cccgggcagg tcctgtaaaa naggaaattc agacatcgta cgactcgtaa	60
ttgaatgtgg agctgactgc aatattttgt caaagcacca gaatagtgcc ctgcactttg	120
cgaagcagtc taacaatgtg cttgtgtacg acttgctgaa gaaccattta gagacacttt	180
caagagtagc agaagagaca ataaaggatt actttgaagc tcgccttget ctgctagaac	240
cagtttttcc aatcgcatgt catcgactct gtgagggtcc agatttttca acagatttca	300
attaccaacc cccacagaaac ataccagaag gctctggcat cctgctgttt atcttccatg	360
caaacttttt gggtaaagaa gttattgtct ggctctgtgg accgtgtagt gtacaagctg	420
tagttctgaa tgataaattt cagcttctctg ttttctgtgg tctcgtctg ttgtccaggc	480
tggagtgcag tggcgcgat tacagctcac tggagctctg acttcccagg cacaagcaat	540

cctccacact cagcctccta actacctggg actaaaaatg caccgccacc acattccgg 599

<210> 174
 <211> 458
 <212> DNA
 <213> Homo sapien
 <220>
 <221> misc_feature
 <222> (1)...(458)
 <223> n = A,T,C or G

<400> 174
 tcgatttggc cgccccggca ggtccatgcn gnttntgccc attcccatgg ngcccgacaa 60
 ncccatcccc gagggcgaca tcccatgtt catgttcatg cccaccatgc cctggctcat 120
 ccctgcgctg tccccagag gggccattcc catggtgccc gtcattacac cgggcatgtt 180
 cataggcatg ggtcccccca ggagaggggt agnttgaggc cggacaggaa gcatgtttga 240
 tggagaactg aggttcacag nctccaaaac tttgagtcac cacattcata ggctgctgca 300
 tattctgtct gctgaatcca ttgtatncag tgatggcctg ctggggnttt ggaaggctng 360
 cataccaggt agtaagntcg tctaggctga tgtttacacc tggggtcaga ccaagtanga 420
 gggcaagggt ttgctgactg attttctgga cccatatac 458

<210> 175
 <211> 1206
 <212> DNA
 <213> Homo sapien

<400> 175
 ggcacgagga agttttgtgt actgaaaaag aaactgtcag aagcaaaaga aataaaatca 60
 cagtttagaga accaaaaagt taaatgggaa caagagctct gcagtgtgag gtttctcaca 120
 ctcatgaaaa tgaaaattat ctcttacctg aaaattgcat gttgaaaaag gaaattgcc 180
 tgctaaaact ggaaatagcc aactgaaac accaatacca ggaaaaggaa aataaatact 240
 ttgaggacat taagatttta aaagaaaaga atgctgaact tcagatgacc ctaaaactga 300
 aagaggaatc attaaactaaa agggcatctc aatatagtgg gcagcttaaa gttctgatag 360
 ctgagaacac aatgctcact tctaaattga aggaaaaaca agacaaagaa atactagagg 420
 cagaaattga atcacaccat cctagactgg cttctgctgt acaagaccat gatcaaattg 480
 tgacatcaag aaaaagtcaa gaacctgctt tccacattgc aggagatgct tgtttgcaaa 540
 gaaaaatgaa tgttgatgtg agtagtacga tatataacaa tgagggtgctc catcaaccac 600
 tttctgaagc tcaaaggaaa tccaaaagcc taaaaattaa tctcaattat gccggagatg 660
 ctctaagaga aaatacattg gtttcagaac atgcacaaag agaccaacgt gaaacacagt 720
 gtcaaagtga ggaagctgaa cacatgtatc aaaacgaaca agataatgtg aacaaacaca 780
 ctgaacagca ggagtctcta gatcagaaat ttttcaact acaaagcaaa aatatgtggc 840
 ttcaacagca attagttcat gcacataaga aagctgacaa caaaagcaag ataacaattg 900
 atattcattt tcttgagagg aaaatgcaac atcatctcct aaaagagaaa aatgaggaga 960
 tatttaatta caataaccat ttaaaaaacc gtatatatca atatgaaaa gagaaagcag 1020
 aaacagaagt tatataatag tataaacctg ccaaggagcg gattatctca tcttcactct 1080
 gtaattccag tgtttgtcac gtggtgtgtg aataaatgaa taaagaatga gaaaaccaga 1140
 agctctgata cataatcata atgataatta tttcaatgca caactacggg tgggtgctgct 1200
 cgtgcc 1206

<210> 176
 <211> 317
 <212> PRT
 <213> Homo sapien

<400> 176
Met Gly Thr Arg Ala Leu Gln Cys Glu Val Ser His Thr His Glu Asn
1 5 10 15
Glu Asn Tyr Leu Leu His Glu Asn Cys Met Leu Lys Lys Glu Ile Ala
20 25 30
Met Leu Lys Leu Glu Ile Ala Thr Leu Lys His Gln Tyr Gln Glu Lys
35 40 45
Glu Asn Lys Tyr Phe Glu Asp Ile Lys Ile Leu Lys Glu Lys Asn Ala
50 55 60
Glu Leu Gln Met Thr Leu Lys Leu Lys Glu Glu Ser Leu Thr Lys Arg
65 70 75 80
Ala Ser Gln Tyr Ser Gly Gln Leu Lys Val Leu Ile Ala Glu Asn Thr
85 90 95
Met Leu Thr Ser Lys Leu Lys Glu Lys Gln Asp Lys Glu Ile Leu Glu
100 105 110
Ala Glu Ile Glu Ser His His Pro Arg Leu Ala Ser Ala Val Gln Asp
115 120 125
His Asp Gln Ile Val Thr Ser Arg Lys Ser Gln Glu Pro Ala Phe His
130 135 140
Ile Ala Gly Asp Ala Cys Leu Gln Arg Lys Met Asn Val Asp Val Ser
145 150 155 160
Ser Thr Ile Tyr Asn Asn Glu Val Leu His Gln Pro Leu Ser Glu Ala
165 170 175
Gln Arg Lys Ser Lys Ser Leu Lys Ile Asn Leu Asn Tyr Ala Gly Asp
180 185 190
Ala Leu Arg Glu Asn Thr Leu Val Ser Glu His Ala Gln Arg Asp Gln
195 200 205
Arg Glu Thr Gln Cys Gln Met Lys Glu Ala Glu His Met Tyr Gln Asn
210 215 220
Glu Gln Asp Asn Val Asn Lys His Thr Glu Gln Gln Glu Ser Leu Asp
225 230 235 240
Gln Lys Leu Phe Gln Leu Gln Ser Lys Asn Met Trp Leu Gln Gln Gln
245 250 255
Leu Val His Ala His Lys Lys Ala Asp Asn Lys Ser Lys Ile Thr Ile
260 265 270
Asp Ile His Phe Leu Glu Arg Lys Met Gln His His Leu Leu Lys Glu
275 280 285
Lys Asn Glu Glu Ile Phe Asn Tyr Asn Asn His Leu Lys Asn Arg Ile
290 295 300
Tyr Gln Tyr Glu Lys Glu Lys Ala Glu Thr Glu Val Ile
305 310 315

<210> 177
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Made in the Lab

<400> 177
ccaatcatct ccacaggagc

<210> 178
<211> 1665

<212> DNA

<213> Homo sapien

<400> 178

```

gcaaaactttc aagcagagcc tcccgagaag ccattctgctc tcgagcctgc cattgaaatg      60
caaaagtctg  ttccaaataa agccttggaa  ttgaagaatg aacaaacatt gagagcagat      120
cagatgttcc  cttcagaatc  aaaacaaaag aaggttgaag aaaattcttg ggattctgag      180
agtctccgtg  agactgtttc  acagaaggat  gtgtgtgtac ccaaggctac acatcaaaaa      240
gaaatggata  aaataagtgg  aaaattagaa gattcaacta gcctatcaaa aatcttggat      300
acagttcatt  cttgtgaaag  agcaagggaa cttcaaaaag atcactgtga acaacgtaca      360
ggaaaaatgg  aacaaatgaa  aaagaagttt tgtgtactga aaaagaaact gtcagaagca      420
aaagaaataa  aatcacagtt  agagaaccaa aaagttaa at  gggaacaaaga gctctgcagt      480
gtgaggtttc  tcacactcat  gaaaatgaaa attatctctt acatgaaaat tgcattgtga      540
aaaaggaaat  tgccatgcta  aaactggaaa tagccacact gaaacaccaa taccaggaaa      600
aggaaaataa  atactttgag  gacattaaga ttttaaaaga aaagaatgct gaacttcaga      660
tgaccctaaa  actgaaagag  gaatcattaa ctaaaagggc atctcaatat agtgggcagc      720
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<210> 179

<211> 179

<212> PRT

<213> Homo sapien

<400> 179

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Asn Glu Gln Thr Leu Arg Ala Asp Gln Met Phe Pro Ser Glu Ser Lys
          35           40           45
Gln Lys Lys Val Glu Glu Asn Ser Trp Asp Ser Glu Ser Leu Arg Glu
          50           55           60
Thr Val Ser Gln Lys Asp Val Cys Val Pro Lys Ala Thr His Gln Lys
          65           70           75           80
Glu Met Asp Lys Ile Ser Gly Lys Leu Glu Asp Ser Thr Ser Leu Ser
          85           90           95
Lys Ile Leu Asp Thr Val His Ser Cys Glu Arg Ala Arg Glu Leu Gln
          100          105          110
Lys Asp His Cys Glu Gln Arg Thr Gly Lys Met Glu Gln Met Lys Lys
          115          120          125

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Lys Phe Cys Val Leu Lys Lys Lys Leu Ser Glu Ala Lys Glu Ile Lys
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 Ser Gln Leu Glu Asn Gln Lys Val Lys Trp Glu Gln Glu Leu Cys Ser
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 Ile Ala Cys

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 <212> DNA
 <213> Homo sapien

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 caaaagaaat aaaatcacag ttagagaacc aaaaagttaa atgggaacaa gagctctgca 180
 gtgtgagatt gactttaaac caagaagaag agaagagaag aaatgccgat atattaaatg 240
 aaaaaattag ggaagaatta ggaagaatcg aagagcagca taggaaagag ttagaagtga 300
 aacaacaact tgaacaggct ctcaagaatac aagatataga attgaagagt gtagaaagta 360
 atttgaatca ggtttctcac actcatgaaa atgaaaatta tctcttcat gaaaattgca 420
 tgttgaaaaa ggaaattgcc atgctaaaac tggaaatagc cacactgaaa caccaatacc 480
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 ggcagcttaa agtcttgata gctgagaaca caatgctcac ttctaaattg aaggaaaaac 660
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 tacaagacca tgatcaaatt gtgacatcaa gaaaaagtca agaacctgct ttccacattg 780
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 <211> 432
 <212> PRT
 <213> Homo sapien

<400> 181
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 35 40 45
 Glu Asn Gln Lys Val Lys Trp Glu Gln Glu Leu Cys Ser Val Arg Leu
 50 55 60
 Thr Leu Asn Gln Glu Glu Lys Arg Arg Asn Ala Asp Ile Leu Asn
 65 70 75 80
 Glu Lys Ile Arg Glu Glu Leu Gly Arg Ile Glu Glu Gln His Arg Lys
 85 90 95
 Glu Leu Glu Val Lys Gln Gln Leu Glu Gln Ala Leu Arg Ile Gln Asp
 100 105 110
 Ile Glu Leu Lys Ser Val Glu Ser Asn Leu Asn Gln Val Ser His Thr
 115 120 125
 His Glu Asn Glu Asn Tyr Leu Leu His Glu Asn Cys Met Leu Lys Lys
 130 135 140
 Glu Ile Ala Met Leu Lys Leu Glu Ile Ala Thr Leu Lys His Gln Tyr
 145 150 155 160
 Gln Glu Lys Glu Asn Lys Tyr Phe Glu Asp Ile Lys Ile Leu Lys Glu
 165 170 175
 Lys Asn Ala Glu Leu Gln Met Thr Leu Lys Leu Lys Glu Glu Ser Leu
 180 185 190
 Thr Lys Arg Ala Ser Gln Tyr Ser Gly Gln Leu Lys Val Leu Ile Ala
 195 200 205
 Glu Asn Thr Met Leu Thr Ser Lys Leu Lys Glu Lys Gln Asp Lys Glu
 210 215 220
 Ile Leu Glu Ala Glu Ile Glu Ser His His Pro Arg Leu Ala Ser Ala
 225 230 235 240
 Val Gln Asp His Asp Gln Ile Val Thr Ser Arg Lys Ser Gln Glu Pro
 245 250 255
 Ala Phe His Ile Ala Gly Asp Ala Cys Leu Gln Arg Lys Met Asn Val
 260 265 270
 Asp Val Ser Ser Thr Ile Tyr Asn Asn Glu Val Leu His Gln Pro Leu
 275 280 285
 Ser Glu Ala Gln Arg Lys Ser Lys Ser Leu Lys Ile Asn Leu Asn Tyr
 290 295 300
 Ala Gly Asp Ala Leu Arg Glu Asn Thr Leu Val Ser Glu His Ala Gln
 305 310 315 320
 Arg Asp Gln Arg Glu Thr Gln Cys Gln Met Lys Glu Ala Glu His Met
 325 330 335
 Tyr Gln Asn Glu Gln Asp Asn Val Asn Lys His Thr Glu Gln Gln Glu
 340 345 350
 Ser Leu Asp Gln Lys Leu Phe Gln Leu Gln Ser Lys Asn Met Trp Leu
 355 360 365
 Gln Gln Gln Leu Val His Ala His Lys Lys Ala Asp Asn Lys Ser Lys
 370 375 380
 Ile Thr Ile Asp Ile His Phe Leu Glu Arg Lys Met Gln His His Leu
 385 390 395 400
 Leu Lys Glu Lys Asn Glu Glu Ile Phe Asn Tyr Asn Asn His Leu Lys
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 Asn Arg Ile Tyr Gln Tyr Glu Lys Glu Lys Ala Glu Thr Glu Asn Ser
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<210> 182

<211> 511

<212> DNA

<213> Homo sapiens

<400> 182
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cattatcttt gagtctatat tctcttgggc tgtaagaaga tgaggaatgt aataggtctg 180
ccccagcct ttcattgccc ctgtaccaag cttgtttcct tgtgcatcct tcccaggctc 240
tggctgcccc ttattggaga atgtgatttc caagacaatc aatccacaag tgtctaagac 300
tgaatacaaa gaacttcttc aagagttcat agacgacaat gccactacaa atgccataga 360
tgaattgaag gaatgttttc ttaaccaaac ggatgaaact ctgagcaatg ttgagggtgt 420
tatgcaatta atatatgaca gcagtctttg tgatttattt taactttctg caagaccttt 480
ggctcacaga actgcagggt atggtgagaa a 511

<210> 183
<211> 260
<212> DNA
<213> Homo sapiens

<400> 183
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gccagggtgca gcgtccatct ccacattgac atctccaccc acctggcctc tcagggtcatt 180
catctcctcc tcgtgggtct tcttcaggta ggccagctcc tccttcaggc tctcaatctg 240
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<210> 184
<211> 461
<212> DNA
<213> Homo sapiens

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ctctatttta gatagattaa cattaaccaa cataattttt tttagatcga gtcagcataa 180
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gattcattgg caaataattt cagtgtggtg tattattaaa tagaaaaaaa aaattttgtt 360
tcctagggtg aagggtcta tgcataccgt tgacttatga tgaccattta tgcactttca 420
aatgaatttg ctttcaaaat aaatgaagag cagacctcgg c 461

<210> 185
<211> 531
<212> DNA
<213> Homo sapiens

<400> 185
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caggcagtg acttgacatg attagctggc atgatttttt cttttttttc ccccaaacat 120
tggttttgtg gccttgaatt ttaagacaaa tattctacac ggcatattgc acaggatgga 180
tggcaaaaaa aagtttaaaa acaaaaaccc ttaacggaac tgccttaaaa aggagacgt 240
cctagtgcct gtcattgtat attaaacata catacacaca atctttttgc ttattataat 300
acagacttaa atgtacaaag atgttttcca cttttttcaa tttttaaaca caacagctat 360
aaacctgaac acatattgta tcatcatgcc ataagactaa aacaattata tttagcgaca 420
agtgaagagg attaaatagt caaatacaag aatgaaaaac gcagtacata gtgtcgcgaa 480
ctcaaatcgg catttagata gatccagtgg tttaaacggc acgtttttgc t 540

<210> 186
<211> 441
<212> DNA
<213> Homo sapiens

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atcaaaagaa tcatcatctt taccttgact ttccaggga ttactgaact ttcttctcag 120
aagatagggc acagccattg ccttggcctc acttgaaggg tctgcatttg ggctcctctg 180
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aatgtctgaa acctcgctct ctgcctgctg gacttctgag gccgtcactg ccactctgtc 360
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<210> 187
<211> 371
<212> DNA
<213> Homo sapiens

<400> 187
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<210> 188
<211> 226
<212> DNA
<213> Homo sapiens

<400> 188
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ttttattcct tgatattttt cttttttttt tttttgtgga tggggacttg tgaatttttc 120
taaagggtgct atttaacatg ggaggagagc gtgtgcggct ccagcccagc ccgctgctca 180
ctttccaccc tctctccacc tgcctctggc ttctcaggac ctgccc 226

<210> 189
<211> 391
<212> DNA
<213> Homo sapiens

<220>
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<222> (1)... (391)
<223> n=A,T,C or G

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cctcgggcgc naccacgcta agggcgaatt ctgcanatat ccatcacact ggcggccgct 180
cgagcatgca tctanagggc ccaattcncc ctatagttag ncgtattaca attcactggc 240

cgtcgtttta caacgtcgtg actgggaaaa cccctggcgtt acccaactta atcgcccttg 300
 agcacatccc cctttcncca gctggcttaa tancaagag gcccgaccg atcgcccttc 360
 ccaacanttg cgcagcctga atggcgaatg g 391

<210> 190
 <211> 501
 <212> DNA
 <213> Homo sapiens

<400> 190
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 actggaggag ctggcagagg cgttgctgtc aaactcctct gccacatctt cctcctcttc 120
 acctgggttg aatgactcat cggtttcttc tcctgagtca tcgctgctgt cattggcatt 180
 ctctcccg atcttgctt cctccttcat cctctccaag taggcatcat gctggctctc 240
 atcagagtca gcatattcat cgtagcttgg gttcatgccc tctttcaatc ctcggttttt 300
 gatgttgagc tttttcgcgt tgacaaaatc aaacagtttc cgtactcct cctctcaat 360
 gctgctgaag gtatactgag tgccctgctt ggtctcaatt tcaaagtcaa aggaacgagt 420
 agtagtggtt ccacgagcaa agttgacaaa ggagatctca tcgaagcgga tgtgcacagg 480
 tggcttgctg acgtagatga a 501

<210> 191
 <211> 241
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (49)
 <223> n=A,T,C or G

<400> 191
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 aacagaaaagt aaaaaactaac atggattgct ataaatatgc tgaagcctag ttgttcaaat 120
 gatacaattc tctcatgcta ctctaaaagt tataaaagaaa aaggatttac actttacaca 180
 ctgtacacaa aaggaatacc ttctgagagc cagggagtgg ggaaagggga aggagacttg 240
 a 241

<210> 192
 <211> 271
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (1)...(271)
 <223> n=A,T,C or G

<400> 192
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 gatagaagan caaaccacgt cccacgaatc ccaataatga cagcttcaga ctttgctttt 120
 ttaacaattt gaaaaattat tctttaatgt ataaagtaat tttatgtaaa ttaataaatc 180
 ataatttcat ttccacattg attaaagctg ctgtatagat ttagggngca ggacttaata 240
 atagnggaaa tgaaattatg atttattaat c 271

<210> 193

<211> 351
<212> DNA
<213> Homo sapiens

<400> 193
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gaccaccgtt cagtcatttt gggttgccgt gtccecaaaa ctttttaaat gaaagtattg 180
gcattcaaaa agacagcaga caaaatgaaa gaaaatgaga gcagaaagta agcattttcca 240
gcctatctaa tttctttagt tttctatttg cctccagtgc agtccatttc ctaatgtata 300
ccagcctact gtactattta aaatgctcaa tttcagcacc gatggacctg c 360

<210> 194
<211> 311
<212> DNA
<213> Homo sapiens

<400> 194
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ctctgggtgtt cccaccaccc tagatgaaaa tccacagcac agacctctac cgtgtttctc 180
ttccatccct aaaccacttc cttaaaatgt ttggatttgc aaagccaatt tggggcctgt 240
ggagcctggg gttggatagg gccatggctg gtccccacc atacctcccc tccacatcac 300
tgacacagac c 311

<210> 195
<211> 381
<212> DNA
<213> Homo sapiens

<400> 195
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gccaacagga tgacatgaaa tgatgtactc agaagtgtcc tggaatgggg cccatgagat 120
ggttgtctga gagagagctt cttgtcctgt ctttttcctt ccaatcaggg gctcgctctt 180
ctgattattc ttcagggcaa tgacataaat tgtatattcg gttcccgggt ccaggccagt 240
aatagtagcc tctgtgacac cagggcgggg ccgagggacc acttctctgg gaggagaccc 300
aggcttctca tacttgatga tgtagccggt aatcctggca cgtggcggtt gccatgatac 360
cagcagggaa ttgggtgtgg t 381

<210> 196
<211> 401
<212> DNA
<213> Homo sapiens

<400> 196
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gccccaaacct ggagacctga ttgagatttt ccgccttggc tatgagcact gggccctgta 120
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tattgtgagc aggaactgtg agcactttgt caccagacc t 401

<210> 197
<211> 471

<212> DNA

<213> Homo sapiens

<400> 197

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ctgtaatgat gtgagcaggg agccttcctc cctgggcccac ctgcagagag ctttcccacc 60
aactttgtac cttgattgcc ttacaaagtt atttgtttac aaacagcgac catataaaag 120
cctcctgccc caaagcttgt gggcacatgg gcacatacag actcacatac agacacacac 180
atatatgtac agacatgtac tctcacacac acaggcacca gcatacacac gtttttctag 240
gtacagctcc caggaacagc taggtgggaa agtcccatca ctgagggagc ctaacctatg 300
ccctgaacaa aaattgggca ctcatctatt ccttttctct tgtgtcccta ctcattgaaa 360
ccaaactctg gaaaggaccc aatgtaccag tatttatacc tctagtgaag cacagagaga 420
ggaagagagc tgcttaaaact cacacaacaa tgaactgcag acacagacct g 480
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<210> 198

<211> 201

<212> DNA

<213> Homo sapiens

<400> 198

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aagcccagaa gtttagggaa aagctgcaag aaataaagac actcaaccag aaggaggctg 120
tggtcctatgc agtcaactcc tggaccacta gtatttcagg tatgtctgtg aaagtgggaa 180
tcctctacat tggtygggcag a 201
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<210> 199

<211> 551

<212> DNA

<213> Homo sapiens

<400> 199

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gggcctggaa cacaccatct tccccatgag cccggtgccc agtctggtga cttccatctt 120
ggccccctggc cttatgtccc agttatgacc cctgacttca actctggctc ttaccctgta 180
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acctcgattc ccatcttgag cccagtgtta gtccatgaga tcatgacctg actcctggtc 300
tccaaccttg tgatccta atctgggacct caatcctagc ctctgaactt gggaccctgg 360
agctcctgac cttagtcctg accgctaccc ttgattctga cctttgatcc tgtaacttag 420
gggtggcccc tgaccttatt actgtcattt agtccttga ccttgccact tcaatcctgg 480
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atgaccacaa t 551
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<210> 200

<211> 211

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(211)

<223> n=A,T,C or G

<400> 200

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tgtaagagag gctgctgnca ccattacctg cagaaacctt ctcatagggg ctacgatcgg 120
tactgctagg gggcacatag cgcccatggg tgtggtagggt ggggnactcn ntnataggat 180
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ggtaggtatc cccgggctgga aanatgnnca g

211

<210> 201

<211> 111

<212> DNA

<213> Homo sapiens

<400> 201

ccagtgaag gaaacaaaac tggcagtttg tccatttgaa tatcagacct agttttcttct 60
taatttccac actattttctc ccatatttctt taaacttctt ggcattccacc t 120

<210> 202

<211> 331

<212> DNA

<213> Homo sapiens

<400> 202

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ggagagagag agagaggaaa attccctaac ccttggttta aagacaatat tcattttattg 120
ctcaaatgat gcttttaagg gaggacagtg gaataaaaata aacttttttt ttctccctac 180
aatacataga aggggttatca aaccactcaa gtttcaaaat ctttccaggg tccaatatca 240
ctttttttct ttcggttcaa tgaaaagcta aatgtaataa tactaattat agataaaatt 300
ttattttact ttttaaaaat ttgtccagac c 331

<210> 203

<211> 491

<212> DNA

<213> Homo sapiens

<400> 203

agtcacccag tctacttagt acctgggttg tgcctctgac cttttcagct tgataccctg 60
ggcttttagtg taaccaataa atctgtagtg accttacctg tattccctgt gctatcctgt 120
gggaaggtag gaatgggcta agtatgatga atgtatagg tagggatctt ttgggttttaa 180
atcacagaaa acctaatcca aactggctta aaataaaaag gattttattgg ttcatgtaac 240
tagaaagtcc ataggttagtg ctgggtccag gtgaagactt gacccagtag ttcagtatgt 300
ctctaaatac cggactgact tttttctcac tgttgcatct tctgtaggac catttaagtc 360
tgggccactt aatggctgcc agcatctcta agattacact tttccccatt tatgtccaat 420
cagaaaaaga aggcattctt gtaccagaaa tctcagcaaa agccctaata ttcacactga 480
ttagggacctg c 491

<210> 204

<211> 361

<212> DNA

<213> Homo sapiens

<400> 204

tccttctctc ccccatgtga taaatgggtc cagggtgat caaagaactc tgactgcaga 60
actgccgctc tcagtggaca gggcatctgt tatcctgaga cctgtggcag acacgtcttg 120
ttttcatttg atttttgta agagtgcagt attgcagagt ctagaggaat tttgttttc 180
ttgattaaca tgattttcct ggttggtaca tccagggcat ggcagtggcc tcagccttaa 240
acttttgctc ctactccac cctcagcgaa ctgggcagca cggggagggt ttggctacc 300
ctgcccattc ctgagccagg taccaccatt gtaaggaaac actttcagaa attcagacct 360
c 361

<210> 205

<211> 471
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (2)
<223> n=A,T,C or G
<221> misc_feature
<222> (3)
<223> n=A,T,C or G

<400> 205
cnngtacagt tcttcctgga tggccgacac agatcctggg gaaaggcaat cctggcactg 60
ctctgaaacc agagctcctc ctccctcccc gggcaggggt gagctgagaa gggctgctct 120
agcgttgagg ctccacctcc atacacctga tattttgata gggcaggtcc ctgctatggg 180
ccactgttct gggcagtgata gtatgcttga cagcatcctt ggcattctat caccagatcc 240
cagagcaccg gctactagct gtgacaacat cctccaaaca ttgcaaaatt tcccctggga 300
ggcaagattg cctcagatgg gagaatcacg ctctagggaa atctgctggt atgagaacct 360
caactcccca ctccactgag cctccagatg gcgagcaggc tgcagctcca gcacagacac 420
gaagctccct ccagccactg acggtccatg gctgggggta cccaggacct c 480

<210> 206
<211> 261
<212> DNA
<213> Homo sapiens

<400> 206
tagagtattt agagtcctga gataacaagg aatccaggca tcttttagac agtcttctgt 60
tgtcttttct tcccaatcag agatttgtgg atgtgtggaa tgacaccacc accagcaatt 120
gtagccttga tgagagaatc caattcttca tctccacgaa tagcaagttg caagtgcaga 180
ggggtaatac gctttacctt taagtctttt gatgcatttc ctgccagttc aagtacctct 240
gcggtgaggt actccaggat g 261

<210> 207
<211> 361
<212> DNA
<213> Homo sapiens

<400> 207
gctctccggg agcttgaaga agaaactggc tacaaagggg acattgccga atgttctcca 60
gcggtctgta tggacccagg cttgtcaaac tgtactatac acatcgtgac agtcaccatt 120
aacggagatg atgccgaaaa cgcaaggccg aagccaaagc caggggatgg agagtgtgtg 180
gaagtcattt ctttacccaa gaatgacctg ctgcagagac ttgatgctct ggtagctgaa 240
gaacatctca cagtggacgc caggggtctat tcctacgctc tagcactgaa acatgcaaat 300
gcaaagccat ttgaagtgcc cttcttgaaa ttttaagccc aaatatgaca ctggacctgc 360
c 361

<210> 208
<211> 381
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature

<222> (1)...(381)

<223> n=A,T,C or G

<400> 208

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agaggagatn tttgccatgc ctgaatnctt tccatncca ccctancact taacatatta 60
cttagtctgc tttgntaaaa gcaagtatta ccttnaactt gncctcttact ctttgccctt 120
tagctaacta ataaagnttg atntaggcat tattatataa ttctgagtca ttcatgggtat 180
ctctcatgtt tgatgtatct tncaaactaa gatctatgat agtttttttt ccanaggtcc 240
attaaatcat ttatttcctt tactttctca cctctgtnga aacatttaga aactggattt 300
gggaacccan ttttgaaaa ccagattcat agtcatgaaa atggaaactt ncatattctg 360
tttttgaaaa gatgtggacc t 381
```

<210> 209

<211> 231

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (83)

<223> n=A,T,C or G

<400> 209

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gtggagagca agtgatttat taaagcaaga cggtgaaacc tttacattct gcagtgaaga 60
tcaggggtgc attgaaagac agnggaaacc aggatgaaag tttttacatg tcacacacta 120
catttcttca atattttcac caggacttcc gcaatgaggc ttcgtttctg aagggacatc 180
tgatccgtgc atctcttcac tcctaacttg gctgcaacag cttccacctg c 240
```

<210> 210

<211> 371

<212> DNA

<213> Homo sapiens

<400> 210

```
tccatcctgg ttttgacagag atcagggttg tgacagttcc tgggtgaccc acagctaccc 60
atgtcagtta tctccactaa catatccaag aatctttgta ggacaatttc tccacctgca 120
agggttttta ggtagaactc ttcttttaag gcaattagcc cattgccaaa aggttttact 180
gtcttaaaagc tgtctttctg agatctaatt ccaaggactt ctccacagct aagtggagatg 240
cctcacacca ttaggtgatg ctttgacag aacagagtat tttcatcttg tgtttaaaagc 300
aatccttggt cttcggtccc tcaccacttt ctatgccagt ctcccattta tgtccctagt 360
aatgcctatg c 371
```

<210> 211

<211> 471

<212> DNA

<213> Homo sapiens

<400> 211

```
tttattttta aagaaaaaaa ttaaaataga gccaacaaat gcaattaaga aaaaaaaagt 60
attgagacac aaggggacct acatgttctg gtctaagaag catgcaagta ttacaaagca 120
ttccagatac agtatgacag aggaacagtg aacaagcatt ggaacgatgc tctttcttcc 180
agaaacggya agtctaacag ttatgttttc acaatggtag tgattaaacc atctttattt 240
ttaaggaatt ttataggaag aatttttagca ccatacattaa agggaaaaata ataatacctt 300
tttagccctg cctatctcca gtcttggaat aataacagaa gcatagcacc tttcagtatc 360
taaaatataa acaagaatag taagtccatc ccagcttcta gagatgaggt agctcatgct 420
```

aagaaatggt gggtcatttt tcctatgaaa gttcaaaggc caaatgggtca c 480

<210> 212

<211> 401

<212> DNA

<213> Homo sapiens

<400> 212

```
tggcctgtct ccttcacata gtccatatca ccacaaatca cacaacaaaa gggagaggat 60
atattttggg ttcaaaaaaa gtaaaaagat aatgtagctg catttctttg gttattttgg 120
gccccaaata tttcctcatc tttttgttgt tgtcatggat ggtggtgaca tggacttggt 180
tatagaggac aggtcagctc tctggctcgg tgatctacat tctgaagttg tctgaaaatg 240
tcttcatgat taaattcagc ctaaacgttt tgccgggaac actgcagaga caatgctgtg 300
agtttccaac ctcagcccat ctgcgggcag agaaggtcta gtttgtccat caccattatg 360
atatcaggac tggttacttg gttaaggagg ggtctacctc g 401
```

<210> 213

<211> 461

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(461)

<223> n=A,T,C or G

<400> 213

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tgtgaagcat acataaataa atgaagtaag ccatactgat ttaatttatt ggatgttatt 60
ttccctaaga cctgaaaatg aacatagtat gctagtattt ttccagtgtt agccttttac 120
tttcctcaca caatttgga tcatataata taggtacttt gtccctgatt aaataatgtg 180
acggatagaa tgcataaagt gtttattatg aaaagagtgg aaaagtatat agcttttanc 240
aaaaggtgtt tgccatttct aagaaaatgag cgaatatata gaaatagtn gggcatttct 300
tcctgttagg tggagtgtat gtgttgacat ttctcccat ctcttccac tctgttnt 360
ccccattatt tgaataaagt gactgctgaa nangactttg aatccttacc cacttaattt 420
aatgtttaaa gaaaaaccta taatggaaag tgagactcct t 461
```

<210> 214

<211> 181

<212> DNA

<213> Homo sapiens

<400> 214

```
cctgagcttc tactcctttc ccttaagatt cctccaaagc accagctcca taaaatcctt 60
cagctcccca gaccacacc aagaaccca catgttaatt ggatcagcca aatctacaag 120
cagataagtc ctaaggagaa tgccgaagcg ttttcttct tcctcaagcc tagcatgaga 180
c 181
```

<210> 215

<211> 581

<212> DNA

<213> Homo sapiens

<400> 215

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ctgctttaag aatggttttc caccttttcc ccctaattct taccaatcag acacatttta 60
ttatttaaat ctgcacctct ctctatttta ttgcccagg gcacgatgtg acatatctgc 120
```

agtcccagca cagtgggaca aaaagaattt agaccccaaa agtgtcctcg gcatggatct 180
tgaacagaac cagtatctgt catggaactg aacattcatc gatggctctc atgtattcat 240
ttattcactt gttcattcaa gtattttattg aatacctgcc tcaagctaga gagaaaagag 300
agtgcgcttt ggaaatttat tccagttttc agcctacagc agattatcag ctccggtgact 360
tttctttctg ccaccattta ggtgatggtg tttgattcag agatggctga atttctattc 420
ttagcttatt gtgactgttt cagatctagt ttgggaacag attagaggcc attgtcctct 480
gtcctgatca ggtggcctgg ctgtttcttt ggatccctct gtcccagagc caccagaac 540
cctgactctt gagaatcaag aaaacaccca gaaaggacct c 581

<210> 216
<211> 281
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(281)
<223> n=A,T,C or G

<400> 216
ccgatgtcct gcttctgtgg accaggggct cctctgnngg tggcctcaac cacggctgag 60
atccctagaa gtccaggagc tgtggggaag agaagcactt agggccagcc agccggggcac 120
ccccacttgc gcccagaccc acgctcacgc accagacctg cccngggcgt cgctcnaaag 180
ggcgaattct gcagatatcc atcacactgg cggacgctcg agcatgcac tagagggccc 240
aattcacctc atantgagtc gtattacaat tcactggccg t 281

<210> 217
<211> 356
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(356)
<223> n=A,T,C or G

<400> 217
atagcagggt tcaacaattg tcttgtagtt tgnagtaaaa agacataaga aagagaaggt 60
gtggtttgca gcaatccgta gttggtttct caccataccc tgcagttctg tgagccaaag 120
gtcttgcaga aagttaaaat aaatcacaaa gactgctgtc atatattaat tgcataaaca 180
cctcaacatt gctcagagtt tcatccgttt ggtaagaaa acattccttc aattcatcta 240
tggcatttgt agtggcattg tcgtctatga actcttgaag aagttctttg tattcagtct 300
tagacacttg tggattgatt gncttggaaa tcacattctc caataaggga cctcgg 360

<210> 218
<211> 321
<212> DNA
<213> Homo sapiens

<400> 218
ttgtccatcg ggagaaaggt gtttgtcagt tgtttcataa accagattga ggaggacaaa 60
ctgctctgcc aatttctgga tttctttatt ttcagcaaac actttcttta aagcttgact 120
gtgtgggcac tcatccaagt gatgaataat catcaagggt ttgttgcttg tcttggattt 180
atataagact tcttcatatg tctgagtcca gatgagttgg tcacccaac ctctggagag 240
ggctctggggc agtttgggtc gagagtcctt tgtgtccttt ttggctccag gtttgactgt 300

ggatatctctg gacctgcctg g

321

<210> 219

<211> 271

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (41)

<223> n=A,T,C or G

<400> 219

ccgggttaggt ccacgcgggg gcagtgaggg cacaggctca nggtggccgg gctacctggc 60
accctatggc ttacaaagta gagttggccc agtttccttc cacctgaggg gagcactctg 120
actcctaaca gtcttccttg ccctgccatc atctgggggtg gctggctgtc aagaaaggcc 180
gggcatgctt tctaaacaca gccacaggag gcttgtaggg catcttcag gtggggaaac 240
agtcttagat aagtaagggt acttgtctaa g 271

<210> 220

<211> 351

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)... (351)

<223> n=A,T,C or G

<400> 220

gtctacgac gaggaccagc ttttcttctt cnacttttcc canaacactc gggtgccctg 60
cctgcccga tttgctgact gggctcagga acagggagat gctcctgcca ttttatttga 120
caaagagttc tgcgagtgga tgatccagca aatagggcca aaacttgatg ggaaaatccc 180
gggtgtccaga gggtttctta tcgctgaagt gtacacgctg aagcccctgg agtttgga 240
gccccaaact ttggtctgtt ttgtcagtaa tctcttccca cccatgctga cagtgaactg 300
gtagcatcat tccgtccctg tgggaaggatt tgggcctact tttgtctcag a 360

<210> 221

<211> 371

<212> DNA

<213> Homo sapiens

<400> 221

gtctgcagaa gcgtgtctga ggtgtccggt ggagggtggca gccgagctct gggactaatc 60
accgtgctgg ggacggcacc gcgtcaggat gcaggcagat ccctgcagaa gtgtctaaaa 120
ttcacactcc tcttctggag ggacgtcgat ggtattagga tagaagcacc aggggacccc 180
acgaacgggtg tcgtcgaaac agcagccctt atttgcacac tgggagggcg tgacaccagg 240
aaaaccacaa ttctgtcttt cacggggggc cactgtacac gtctctgtct gggcctcggc 300
cagggtgccg agggccagca tggacaccag gaccagggcg cagatcacct tgttctccat 360
ggtggacctc g 371

<210> 222

<211> 471

<212> DNA

<213> Homo sapiens

<400> 222
gtccatgttc catcattaat gttccaacat caccagggac acaaagctgc aaaaatgaga 60
agggaaataa ggtagagaa aggatccggg caatcttaag gactgaggaa gacatgttcc 120
ccaacccttg aactcacaaa ccctgaagct caaggattgc atccttcctc caaatctcac 180
tcaacataat aagtgcagaa caacatgcc aagcactgta tgaagcacta gggacaaaga 240
caaggtcaaa atccttgtaa ccaaatttaa tggattgta atgcagtgtt aacacaggac 300
agtaacagaa caccacaagaa ccaaacagaa gagggtaggg ataagcataa atgaagtaac 360
atgaaataaa cttccaaatg gaaaacttgt ccataccccc agggcaagtc aactacagtc 420
tcccaaagga cataaattcc acttagggca cactagacag aaaacaatat t 480

<210> 223
<211> 411
<212> DNA
<213> Homo sapiens

<400> 223
agttgctcta caatgacaca caaatcccgt taaataaatt ataaacaagg gtcaattcaa 60
atttgaagta atgttttagt aaggagagat tagaagacaa caggcatagc aaatgacata 120
agctaccgat taactaatcg gaacatgtaa aacagttaca aaaataaacg aactctcctc 180
ttgtcctaca atgaaagccc tcatgtgcag tagagatgca gtttcatcaa agaacaaaca 240
tccttgcaaa tgggtgtgac gcggttccag atgtggattt ggcaaacct catttaagta 300
aaaggttagc agagcaaagt gcggtgcttt agctgctgct tgtgccgctg tggcgctggg 360
gaggtcctcg cctgagcttc cttccccagc tttgctgcct gagaggaacc a 420

<210> 224
<211> 321
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (31)
<223> n=A,T,C or G

<400> 224
ggctcgaagt ttgataacaa agaaatatat ntaagacaaa aatagacaag agttaacaat 60
aaaaacacaa ctatctgttg acataacata tggaaacttt ttgtcagaaa gctacatctt 120
cttaatctga ttgtccaaat cattaaaata tggatgattc agtgccattt tgccagaaat 180
tcgtttggct ggatcataga ttaacatttt cgagagcaaa tccaagccat tttcatccaa 240
gtttttgaca tgggatgcta ggcttcctgg tttccatttg ggaaatgtat tcttatagtc 300
ctgtaaagat tccattcttg g 321

<210> 225
<211> 251
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (34)
<223> n=A,T,C or G

<400> 225
atgtctgggg aaagagttca ttggcaaaag tgnctccca agaatggttt acaccaagca 60

gagaggacat gtcactgaat ggggaaaggg aacccccgta tccacagtca ctgtaagcat 120
ccagtaggca ggaagatggc tttgggcagt ggctggatga aagcagattt gagataccca 180
gctccggaac gaggtcatct tctacaggtt cttccttcac tgagacaatg aattcagggg 240
gatcattctc t 251

<210> 226

<211> 331

<212> DNA

<213> Homo sapiens

<220>

<221> unsure

<222> (1)...(331)

<223> n=A,T,C or G

<400> 226

gttaggtccc agggcccccg ccaagnnggtt accnnnnntna ccaactcctga cccaaaaaatc 60
aggcatggca ttaaaacgtt gcaaattcct ttactgttat cccccccacc accaggacca 120
tgtagggtgc agtctttact ccctaaccog tttcccgaaa aagggtgctac ctcttttcca 180
gacagatgag agaggggcagg acttcaggct ggatccacca ctggggtctc cctccccag 240
cctggagcac gggaggggag gtgacggctg gtgactgatg gatgggtagt gggctgagaa 300
gaggggacta ggaaggggcta ttccaggctc a 331

<210> 227

<211> 391

<212> DNA

<213> Homo sapiens

<400> 227

aggtctgccc ttgaagtata ggaaggaatc atagttggag gacttctgca ttatttgttg 60
gctgaagcta gaagtgaac cccctcctga tttctgcagc aagatgaact gccttatccc 120
cagcccgagc gaatgttcat atctgagcaa tcaatgggca ctgtgttcaa ccacgccatt 180
ttcaagattg gctccttaaa ccaccacaa ggcaccagct ctggggagaag ctgcagggag 240
aagagaacaa agccctcgct gtgacagga tgggtgtctc atacctttc tctggggcca 300
ttccaggtat gagacagag tgaacctgcg catgagcgtg gaggccgaca tcaacggcct 360
gcgcaggggtg ctggatgagc tgacctgga c 391

<210> 228

<211> 391

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (35)

<223> n=A,T,C or G

<400> 228

gttgctccata gccacctcct gggatagaag ctttntagtt catagtctga ttagtggtgc 60
cttaggacat aggtccagcc ctacagatta gctgggtgaa gaaggcaagt gtctcgacag 120
ggcttagtct ccacctcag gcatggaacc attcaggggtg aagcctggga tgggggcaca 180
ggagactcag gctgatataa aaataacaaa atcagtaata aaaaaattat aaaacctgtt 240
gcttgtctga atagatttga gcaacagtct tgcttttgtt aaaatcctgg agccgttaag 300
tcctgaatat tcttctggac atcattgctg gctggagaaa ggagccccag gcccggtctg 360
gctgacatct gtcaggtttg gaagtctcat c 391

<210> 229
<211> 341
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (202)
<223> n=A,T,C or G

<400> 229
gtccatggct tctcaccag acagtcttctc tgggcaactt ggggaagccc ctgttctgct 60
caagtctcac cccatggaag aggtggggga agggggcctt ggtttttcag gaagacgggt 120
tggagagcac gagtcactac aaagcagtaa aagtgaatgg tgtctccagg ggctgggtcc 180
agaacaccgc ggagagcccc anccataaag gtgtgttccg cctctggcct gcaggaatct 240
ctttgaatct ctttgattgg tggctccaag agcaatggga agtcaacagc caggaggctg 300
gactgggttc cctgggaccc cgaggctcca gaggtgctg g 341

<210> 230
<211> 511
<212> DNA
<213> Homo sapiens

<400> 230
gtccaagcca aggaaaccat tcccttacag gagacctccc tgtacacaca ggaccgcctg 60
gggctaaagg aaatggacaa tgcaggacag ctagtgttct tggctacaga aggggacct 120
cttcagttgt ctgaagaatg gttttatgcc cacatcatat cattccttgg atgaaacccg 180
tatagtccac aatagagctc agggagcccc taactcttcc aaaccacatg ggagacagtt 240
tccttcatgc ccaagcctga gctcagatcc agcttgcaac taatccttct atcatctaac 300
atgccctact tggaaagatc taagatctga atcttatcct ttgccatctt ctgttaccat 360
atgggtgttg atgcaagttt aattaccatg gagattgttt taaaaacttt tgatgtggtc 420
aagttcagtt ttagaaaagg gagtctgttc cagatcagtg ccagaactgt gccaggcccc 480
aaaggagaca actaactaaa gtagtgagat a 511

<210> 231
<211> 311
<212> DNA
<213> Homo sapiens,

<400> 231
gggtccaagta agctgtgggc aggcaagccc ttcggtcacc tgttggttac acagaccctt 60
cccctcgtgt cagctcaggc agctcgaggc ccccgaccaa cacttgacag ggctccctgct 120
agttagcgcc ccaccgcctg ggagttcgta ccgcttcctt agaacttcta cagaagccaa 180
gctccctgga gccctgttgg cagctctagc tttgcagtcg tgaattggc ccaagtcatt 240
gtttttctcg cctcactttc caccaagtgt ctagagtcac gtgagcctcg tgtcatctcc 300
ggggtggacc t 311

<210> 232
<211> 351
<212> DNA
<213> Homo sapiens

<400> 232
tcgttttagct aataatccct tccttgatga tacactccaa cttcttggtt ttctttattt 60

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ctaaaaagcg gttctgtaac tctcaatcca gagatgttaa aaatgtttct aggcacggta 120
ttagtaaatc aagtaaattt catgtcctct taaaggacaa acttccagag atttgaatat 180
aaatttttat atgtgttatt gattgtcgtg taacaaatgg cccccacaaa ttagtagctt 240
aaaatagcat ttatgatgtc actgttttct ttgccttttc attaatgttc tgtacagacc 300
tatgtaaaca acttttgtat atgcatatag gatagctttt ttgagggtat a 360

```

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<210> 233
<211> 511
<212> DNA
<213> Homo sapiens

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```

<400> 233
aggtctggat gtaaggatgg atgctctcta tacatgctgg gttggggatg ctgggactgc 60
acagccaccc ccagtatgcc gctccaggac tctgggacta gggcgccaaa gtgtgcaaat 120
gaaaatacag gataccagg gaactttgaa tttcagattg tgaaaagaaa acaaatcttg 180
agactccaca atcaccaagc taaaggaaaa agtcaagctg ggaactgctt agggcaaagc 240
tgctcccat tctattcaca gtcaccccc tgaggctcac ctgcatagct gattgcttcc 300
tttcccttat cgcttctgta aaaatgcaga ctactgagc cagactaaat tgtgtgttca 360
gtggaaggct gatcaagaac tcaaaagaat gcaacctttt gtctcttacc tactacaacc 420
aggaaagccc cacttaaggg ttgtcccacc ttactggact gaaccaaggt acatcttaca 480
cctactgatt gatgtctcat gtccccctaa g 511

```

```

<210> 234
<211> 221
<212> DNA
<213> Homo sapiens

```

```

<400> 234
caggtccagc gaaggggctt cataggctac accaagcatg tccacataac cgaggaagct 60
ctctccatca gcatagcttc cgatgacccat ggtgttccac aaaggggttca tcttcgagcg 120
ccggctgtac atggccctgg tcagccatga atgaatagct ctaggactat agctgtgtcc 180
atctcccaga agctcctcat caatcaccat ctggccgaga c 221

```

```

<210> 235
<211> 381
<212> DNA
<213> Homo sapiens

```

```

<220>
<221> misc_feature
<222> (33)
<223> n=A,T,C or G

```

```

<400> 235
ggtccaagaa agggacatct atgtgaaagt ganactgaga cagtgtggtt cacaggctcat 60
gtctcagaat aatacattcc caggcactgt cacgtggggg acccaagagg ccccaggagt 120
gacctataac ctctccagaa agaccactct gtgtggcatc acagtccaca cagttaaagg 180
aaatatttag acttaacaat cagacaccag ctcttactca cacttacact cacagcccac 240
acacaagtgt gcaaacatac acacacatat atatttcctg atacattcat ggaatatcag 300
agccctgccc tgaagtcgtt agtgtctctg ctccccaaac cgctgtctcc acattgggcta 360
agctccctca agagacctca g 381

```

```

<210> 236
<211> 441
<212> DNA

```

<213> Homo sapiens

<400> 236

```
aggtcctgtt gcccttttct ttgcccac ttcgccattt gggaattgga atatttaccc 60
aacacctgta ctgcattgaa tattggaagc aaataacttg gctttgatct tataggctca 120
cagatggagg aacgtacctt gaagttcaga tgagatttcg gacttttgag ttgatgctga 180
aacagcttga gatttttggg gactactgag agatgataat tgtattgtgc aatatgagaa 240
ggacatgaga ttggtgggc ataggtgtga aatgacattg ttggatgtg ttaccctcc 300
aaatctcttg ttgaatgtga tcttaaactg ttggtgggg cctagtggaa ggtgttgaat 360
catgggggtg gactcttcac aatttgctta gctccatccc cttggtgatg agcaagtcct 420
tgctctgttg tgccacatga g 441
```

<210> 237

<211> 281

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(281)

<223> n=A,T,C or G

<400> 237

```
tcctaaaaaa ttagctgacc ttgttaaaaa tgttggcgtg agcagtatat tattacctat 60
ctttttttat tgtgtgtgtg nggtgtgtgn ttaaactaat tggctgaaat atctgcctgt 120
ttccctcttt acatttttct tgtttcttcc cttatttacc ttgtccatc ttgagatcta 180
ctgtaaagtg aatnttttaa tgaaaacann nccaagttnt actctcactg ggnctgggac 240
atcagatgta attgagaggc caacaggtaa gtcttcatgt c 281
```

<210> 238

<211> 141

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(141)

<223> n=A,T,C or G

<400> 238

```
gtctgcctcc tcctactgtt tccctctatn aaaaagcctc cttggcgcag gttccctgag 60
ctgtgggatt ctgcactggg gcttnggatt ccctgatatg ttccctcaaa tccactgaga 120
attaaataaa catcgctaaa g 141
```

<210> 239

<211> 501

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(501)

<223> n=A,T,C or G

<400> 239

```

aacaatctaa acaaatccct cggttctann atacaatgga tccccatat tgggaaggact 60
ctgangcttt attccccac tatgcntatc ttatcatttt attattatac acacatccat 120
cctaaactat actaaagccc ttttcccatg catggatgga aatggaagat ttttttttaa 180
cttggtctag aagctttaat atgggctgtt gccatgaagg cttgcagaat tgagtcatt 240
ttctagctgc cttattcac atagtgatgg ggtactaaaa gtactgggtt gactcagaga 300
gtcgctgtca ttctgtcatt gctgctactc taacactgag caacactctc ccagtggcag 360
atccccgtga tcattccaag aggagcattc atccctttgc tctaataatc aggaatgatg 420
cttattagaa aacaaactgc ttgaccaggg aacaagtggc ttagcttaag naaacttggc 480
tttgctcana tccctgatcc t
501

```

<210> 240

<211> 451

<212> DNA

<213> Homo sapiens

<400> 240

```

tgctcctgaaa ggccattact aatagaaaca cagcctttcc aatcctctgg aacatattct 60
gtctgggttt ttaatgtctg tggaaaaaaa ctaaacaagt ctctgtctca gtaagagaa 120
atctattggg ctgaagggtt ctgaacctct ttctgggtct cagcagaagt aactgaagta 180
gatcaggaag gggctgcctc aggaaaattc ctagatccta ggaattcagt gagaccctgg 240
gaaggaccag catgctaatac agtgtcagtg aatccacagt ctttacttcc tgcctcataa 300
agggccaggt ctccccagta ccaagtcctt tcctcatgaa gttgtgttgc ctgaggctgt 360
ttagggacca ttgctgtctc tggtcacatg agtctgtctc cttactttag tccctgggca 420
atccttgctt aatgcttttg ttgactcaac g
451

```

<210> 241

<211> 411

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(411)

<223> n=A,T,C or G

<400> 241

```

aatctccagt gtgatggat cggggctaga gcttcaatct ccagtgtgat ggtactgcag 60
cnagagcttc aatctccagt gngatggat tagggctaga tcttcaatct ccagtgtgat 120
ggatcaggg ttagagcttc agcctccagt gtgatggat cagggctaga gcttcagcct 180
ccagtgtgat ggtatcgggg ttagatcttc aatccccagt ggtgggtggt agagcttcaa 240
tctccagtgt gatggattg gggttagagc ttcaatctcc agtctgatgg tgttcggga 300
tggggctttt aagatgtaat tagggtttaa gatcataagg gacctggtct gatggggatt 360
agtncgcttn tatgaagaga cacangaggg cttgctctat ctctgactct c 420

```

<210> 242

<211> 351

<212> DNA

<213> Homo sapiens

<400> 242

```

tcccccttca caacagtaga gacctacaca gtgaactttg gggacttctg agatcagcgt 60
cctaccaaga cccagccca actcaagcta cagcagcagc acttcccaag cctgctgacc 120
acagtcacat cccccatcag cacatggaag gccctggta tggacactga aagggaaggc 180
tggtcctgcc cctttgaggg ggtgcaaaca tgactgggac ctaagagcca gaggctgtgt 240
agaggctcct gctccacctg ccagtctcgt aagaaatggg gttgctgcag tgttgagta 300

```

ggggcagagg gagggagcca aggtcactcc aatdaaaca gctcatggca c 360

<210> 243

<211> 241

<212> DNA

<213> Homo sapiens

<400> 243

gtctgtgctt tatcaggaaa agcacaagaa tatgtttttc tacctaaaac cctctttctac 60
tttaaaaatg gtttgctgaa tttttctatg tttttaaaat gtttttatgc ttttttttaa 120
acacgtaaag gatggaacct aatcctctcc cgagacgcct cctttgtgtt aatgcctatt 180
cttacaacag agaaacaagt acattaatat aaaaacgagt tgattattgg ggtataaaat 240
a 241

<210> 244

<211> 301

<212> DNA

<213> Homo sapiens

<400> 244

ggtccagagc aatagcgtct gtggtgaagc gcctgcactc ctcgggagac atgcctggct 60
tatatgctgc atccacataa ccatagataa aggtgctgcc ggagccacca atggcaaaaag 120
gctgtcgagt cagcattcct cccaggggtc catatacctg acctccttca cgttgggtccc 180
agccagctac catgagatgt gcagacaagt cctctcgata tttatagctg atatttctca 240
ccacatttgc agcagccaaa acaagtggag gttcctccag ttctatccca tggagctcca 300
g 301

<210> 245

<211> 391

<212> DNA

<213> Homo sapiens

<400> 245

ctgacactgc tgatgtgggc cggggggcgc cgaggcacia ctggtggccg gaccattgag 60
gcacctggag ggtaggcagc ttgtggtgca gacaccacag agagagaaaa gttggatgga 120
gtggtgggaa taatcagggt ggcacactgt gcctagaagc ttccagggcc accaagagaa 180
tgggaaggga aactacaaca ttcacaacag aaataggagt caattcactt agaccagaa 240
ctccagaaaag ggggagtgtg ggaatctaca atttcaaagc cagctcgtgt ctacctagag 300
ccccaaactg cataagcacc aggattgtac accttagtcc ctcaagatag tttcaagtga 360
gcgtgcaatt cactcttaca gaggagggcc t 391

<210> 246

<211> 291

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(291)

<223> n=A,T,C or G

<400> 246

tcctccacag gggaagcagg aagttingacc agcttcaggc tggaaactgc ccagggcaca 60
gagctggcaa ggtgcaaagn cntctgcaga atattcacca ggttgacaca gacctccaca 120
ttcagacata ttccaagctt ctgggggtctt cagggcccca gaatttctctg gtcttgggca 180

tggtncacaa gtcatttgc cttcttcatt ttggaagggt ccatattggac ataaaaatgca 240
agcgttctcg tgctncatna taatagggtcc cagcctgcac tgacacattt g 300

<210> 247

<211> 471

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(471)

<223> n=A,T,C or G

<400> 247

cactgagtga atgagtatat aatttatgaa aacagaaaag tgctttggaa aaaaaaaaaag 60
acaacaggag tacatacagn gaacaaaaaa gagggtacca ggaggagcan accctgaaca 120
gttanaacta tggaaatcgc tatgctttgt gttgtcacag gagttaaaat aggaataccc 180
tgcatacaat aaatatttat tggataaata actaagcctg ataccctttt caatgcgtta 240
tacanactnt atcatcacac cactaatcta agttctcana agttaaacat tacaagactt 300
cagaacaaca taggcgtntt tggctccatt taacanaana aggaccatag tgatcattta 360
atctctatga gctgtctta tcttctggaa aaggggccta acaccatttc cttttgcaa 420
aaggtagctg ccttgcttcc agttctacca tctntagca acccatcttt n 480

<210> 248

<211> 551

<212> DNA

<213> Homo sapiens

<400> 248

ccatgggatc aggaatgggg tcaggtcagt tgacctgagc ataccatta aacatgttca 60
aatgtcccca tcccaccac tcacatgaca tggctcccga gccctgagat ctgtatccca 120
agaacctcag ttgagaaata tttatggcag cttcactgtt gctcaagagc ctgggtattg 180
tagcagcctg ggggcaggtt gtccctaagt ttctccaagt tcttcacatc agccagaatc 240
ccatctatgc ttgtctccag caaatggagg tggcccctct gctgacgtgc cctctcttcc 300
agctctgaca tcatgggccc cagttggctg ttgatctggg tcttggctcg ggaaagcttc 360
tgctccagta agaccagccc ctcttcatct acactgagag gctgggtccat cagatgcagg 420
aggccgtcta atgtgttgag tgtgtcttgg attgtaaccc cagcgttctt ggctctggta 480
tcaaccttct gggcttctgt aatcaccatc tgtactgcat ccatattcgt gtcgaactcc 540
agctccttcc t 551

<210> 249

<211> 181

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(181)

<223> n=A,T,C or G

<400> 249

atntccagag ggaccgtaag actggtacaa gtttacacca taagaggcga cgtgggtcagc 60
cacaatgtct tcacctccac aggggctcat cagggnggtc agggcaaggg cccccagcat 120
cagagctttg tttaggatca tctcttcccc aaggcagcct tagcagttgc tgacctgccc 180
g 181

<210> 250
<211> 551
<212> DNA
<213> Homo sapiens

<400> 250
tctgtagcta ggatgagctg gctctcaagc aaaagtttgt cttcctgggt ccatttgtgg 60
ttatcacttg ttattgaatg tacatcacaa attaaagtct gcattggttg acgtaagaga 120
atgtgccgac tttggttaacc aggagatttc atgttactgg actgcctgta gtcacgtatt 180
tctgctatga cacatccgca atgaaaaata ttaacctgag atttttctag gagatcaacc 240
aaaataggag gtaattcttc tgcattccaaa tattcaagca actctccttc ttcatagggc 300
agtcgaatgg tctcgggaatc tgatccggtt tttccctga gcatcagaga atatccctca 360
tttcctgggt atagattgac cactaaacat gacaaagtct cttgcataac aagcttctct 420
aacaagttca catttcttct taatttctta acttcaggtt ctttttcaca ttcttcaata 480
tacaagtcac aaagtctttg aaatacagat tttcttcac ttgataggta tttcctttta 540
ggaggtctct g 551

<210> 251
<211> 441
<212> DNA
<213> Homo sapiens

<400> 251
tgtctgctct cccatcctgg ttactatgag tcgctcttgg cagaaaggac cacagatgga 60
gagcttgga ctcgctccaa ctttgccgaa aaggagacaa ccaccaaagt agtaggttaa 120
aacacaattt tagcagcagt gaaataaaaa gaggaagtga ggatggggcc aggccgcaac 180
tataattaaa ctgtctgttt aggagaagct gaatccagaa gaaacacaag ctgtaaagtg 240
agagaggaca gggagcaggg cctttggaga gcaggagagg acaggctgtc accaagcgct 300
gtcgcggaatc tgccctgaaa gatttgaatt ggacactgtc cagtcacgtg tgtggcaaac 360
cgtactccaa gcacttttct cacggcagag gaaggagctg ccattggctgt acccctgaac 420
gtttgtgggg ccagcgatgt g 441

<210> 252
<211> 406
<212> DNA
<213> Homo sapiens

<400> 252
tttttttttg aacaagtaaa aatttcttta tttgctgaca ataagataac ctacaggga 60
aacctgatga aatctattaa aaagttacta aaactaataa aagaatttag gaaggttata 120
gaatgtaaga ccaagacaca aaaatcaatt acatttctat ataatagcaa tgaacagata 180
ctgaaatttt aaaaactaaa tcattttaca aaagtatcac aatatgaaac actccgggat 240
aaattggata aaagatgtgc aagactgtac aaaagctaca aaacatttat gaaggaaatt 300
ggaagataga aacaagatag aaaatgaaaa tattgtcaag agtttcagat agaaaatgaa 360
aaacaagcta agacaagtat tggagaagta tagaagatag aaaaaat 406

<210> 253
<211> 544
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (224)

<223> n=A,T,C or G

<400> 253

```
gaaggagttc agtagcaaaag tcacacctgt ccaattccct gagctttgct cactcagcta 60
atgggatggc aaagggtggtg gtgctttcat cttcaggcag aagcctctgc ccattccccct 120
caagggtctgc aggcccaagt ctcatgctgc ccttgggtgg gcatctgtta acagaggaga 180
acgtctgggt ggccgcagca gctttgctct gaggcctac aaanctaag cttggtgcta 240
gaaacatcat cattattaaa cttcagaaaa gcagcagcca tgttcagtca ggctcatgct 300
gcctcactgc ttaagtgcct gcaggagccg cctgccaaag tccccctcct acacctggca 360
cactggggtc tgcacaaggc tttgtcaacc aaagacagct tccccctttt gattgcctgt 420
agactttgga gccaaagaaac actctgtgtg actctacaca cacttcagggt ggtttgtgct 480
tcaaagtcac tgatgcaact tgaaaggaaa cagtttaatg gtggaaatga actaccattt 540
ataa
```

<210> 254

<211> 339

<212> DNA

<213> Homo sapiens

<400> 254

```
tggcattcag ggcagtgtct tctgcatctc ctaggaacct cgggagcggc agctccggcg 60
cctggttagcg agaggcgggt tccggagatc ccggcctcac ttcgtccac tgtggttagg 120
ggtgagtcct gcaaagtgtta agtgatttgc tcaagggtgcc catttcgcag gaattggagc 180
ccaggccagt tctctgagcc tatcattagg gctaaaggag tgcgtgatca gaatgggtgc 240
tggacgggtc tacttgtcct gcctgctgct ggggtccctg ggctctatgt gcatcctctt 300
cactatctac tggatgcagt actggcgtgg tggctttgc 339
```

<210> 255

<211> 405

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(405)

<223> n=A,T,C or G

<400> 255

```
gaggtttttt nttttttttt tttttttttt caattaaana tttgatttat tcaagtatgt 60
gaaaacattn tacaatggaa actttnttta aatgctgcat gtncgtgtgt atggaccacn 120
cacatacagc catgctgttt caaaaaactt gaaatgccat tgatagttaa aaaactntac 180
ncccgatgga aaatcgagga aaacaattta atgtttcatn tgaatccana ggngcatcaa 240
attaaatgac agctccactt ggcaataaat agctgttact tgatggtatc caaaaaaaaa 300
tggttgggga tggataaatt caaaaatgct tccccaaagg ngggngggtt ttaaaaagtt 360
tcaggncaca acccttgcan aaaacactga tgcccaacac antga 405
```

<210> 256

<211> 209

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (6)

<223> n=A,T,C or G

```

<400> 256
gggcangtct ggtcctctcc ccacatgtca cactctctcc agcctctccc ccaaccctgc 60
tctcctctct cccctgccct agcccaggga cagagtctag gaggagcctg gggcagagct 120
ggaggcagga agagagcact ggacagacag ctatgggttg gattggggaa gaggttagga 180
agtaggttct taaagaccct ttttagta 209

```

```

<210> 257
<211> 343
<212> DNA
<213> Homo sapiens

```

```

<220>
<221> misc_feature
<222> (1)...(343)
<223> n=A,T,C or G

```

```

<400> 257
tctggacacc ataatccctt ttaagtggct ggatgggtcac acctctccca ttgacaagct 60
gggttaagtc aatagggtga ctaggatcaa caccgaccaa atcaataaga tactgcagtc 120
tattgagact caaaggctta tactggcgctc tgaaactatg tccttcgtta aaccggtatt 180
ttgggattcg gatgtaaaat ggagtctggc ctccctcaaa gcccaagcgg ggccgggttc 240
ctctttgcct ttctccttta tggcctctgc cacatcttct acctcttctc cgacctcttg 300
gtcttntctc nggtttcttg gagccgggat tcggctttaa gtn 343

```

```

<210> 258
<211> 519
<212> DNA
<213> Homo sapiens

```

```

<400> 258
gcggtctctg acttctagaa gactaaggct ggtctgtggt tgcttggttg cccacctttg 60
gctgataccc agagaacctg ggcacttgct gcctgatgcc cacccttgcc agtcattcct 120
ccattcaccg agcgggaggt gggatgtgag acagcccaca ttggaaaatc cagaaaaccg 180
ggaacacaggga ttgccccttc acaattctac tccccagatc ctctcccctg gacacaggag 240
acccacaggg caggacccta agatctgggg aaaggaggtc ctgagaacct tgaggtagcc 300
ttagatcctt ttctaccac tttcctatgg aggattccaa gtcaccactt ctctcaccgg 360
cttctaccag ggtccaggac taaggcggtt tctccatagc ctcaacattt tgggaatctt 420
cccttaatca cccttgctcc tcttgggtgc ctggaagatg gactggcaga gacctctttg 480
ttgcgttttg tgctttgatg ccaggaatgc cgcttagtt 519

```

```

<210> 259
<211> 371
<212> DNA
<213> Homo sapiens

```

```

<400> 259
attgtcaact atatacacag tagtgaggaa taaaatgcac acaaaacaat ggatagaata 60
tgaaaatgtc ttctaaatat gaccagtcta gcatagaacc ttcttctctt ccttctcagg 120
tcttccagct ccatgtcatc taaccactt aacaaacgtg gacgtatcgc ttccagaggc 180
cgtcttaaca actccatttc caaaagtcac ctccagaaga catgtatttt ctatgatttc 240
ttttaaacia atgagaattt acaagatgtg taactttcta actctatttt atcatacgtc 300
ggcaacctct ttccatctag aagggtctaga tgtgacaaat gttttctatt aaaaggttgg 360
ggtggagtgt a 371

```

<210> 260
<211> 430
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(430)
<223> n=A,T,C or G

<400> 260
ttggattttt tgacttgcca ttccagtttt ttactttttt tttttttttt ttttganaaa 60
tactatatatt attgtcaaag agtggtacat aggtgagtg tcatcttccc tctcatgccg 120
gtatactctg cttcgtctgt tcagtaaaag ttttccgtag ttctgaacgt cccttgacca 180
caccataana caagcgcaag tcaactcanaa ttgccactgg aaaactggct caactatcat 240
ttgaggaaag actganaaag cctatcccaa agtaatggac atgcaccaac atcgcggtac 300
ctacatgttc ccgtttttct gccaatctac ctgtgtttcc aagataaatt accacccagg 360
gagtcacttc ctgctatgtg aacaaaaacc cggtttcttt ctggagggtgc ttgactactc 420
tctcgnagac 430

<210> 261
<211> 365
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (178)
<223> n=A,T,C or G

<400> 261
tcctgacgat agccatggct gtaccactta actatgattc tattccaact gttcagaatc 60
atatcacaaa atgacttgta cacagtagtt tacaacgact cccaagagag gaaaaaaaaa 120
aaaaaaagacg cctcaaaatt cactcaactt ttgagacagc aatggcaata ggcagcanag 180
aagctatgct gcaactgagg gcacatatca ttgaagatgt cacaggagtt taagagacag 240
gctggaaaaa atctcatact aagcaaacag tagtatctca taccaagcaa aaccaagtag 300
tatctgctca gcctgccgct aacagatctc acaatcacca actgtgcttt aggactgtca 360
ccaaa 365

<210> 262
<211> 500
<212> DNA
<213> Homo sapiens

<400> 262
cctagatgtc atttgggacc cttcacaaacc attttgaagc cctgtttgag tccctgggat 60
atgtgagctg tttctatgca taatggatat tcgggggttaa caacagtccc ctgcttggct 120
tctattctga atccttttct ttaccatgg ggtgcctgaa ggggtggctga tgcataatggt 180
acaatggcac ccagtgtaaa gcagctacaa ttaggagtgg atgtgttctg tagcatccta 240
tttaataaag cctattttat cctttggccc gtcaactctg ttatctgctg cttgtactgg 300
tgctgtact tttctgactc tcattgacca tattccacga ccatggttgt catccattac 360
ttgatcctac ttacatgtc tagtctgtgt ggttgggtgt gaataggctt ctttttacat 420
gggtcgtcca gccagctaa ttaatggtgc acgtggactt ttagcaagcg ggctcactgg 480
aagagactga acctggcatg 500

<210> 263
<211> 413
<212> DNA
<213> Homo sapiens

<400> 263
ctcagagagg ttgaaagatt tgcctacgaa agggacagtg atgaagctaa gctctagatc 60
caggatgtct gacttcaaat tgaaactccc aaagtaatga gtttgggaagg gtggggtgtg 120
gcctttccag gatgggggtc ttttctgctc ccagcggata gtgaaacccc tgtctgcacc 180
tggttgggcg tggtgctttc ccaaagggtt tttttttagg tccgtcgctg tcttgtggat 240
taggcattat tatctttact ttgtctccaa ataacctgga gaatggagag agtagtgacc 300
agctcagggc cacagtgcga tgaggacat cttctcacct ctctaaatgc aggaagaaac 360
gcagagtaac gtggaagtgg tccacaccta ccgccagcac attgtgaatg aca 420

<210> 264
<211> 524
<212> DNA
<213> Homo sapiens

<400> 264
tccaatgggg ccctgagagc tgtgacagga actcacactc tggcactggc agcaaaacac 60
cattccaccc cactcatcgt ctgtgcacct atgttcaaac tttctccaca gttccccaat 120
gaagaagact catttcataa gtttgtggct cctgaagaag tcctgccatt cacagaaggg 180
gacattctgg agaaggtcag cgtgcattgc cctgtgtttg actacgttcc ccagagctc 240
attaccctct ttatctccaa cattgggtggg aatgcacctt cctacatcta ccgcctgatg 300
agtgaactct accatcctga tgatcatgtt ttatgaccga ccacacgtgt cctaagcaga 360
ttgcttaggc agatacagaa tgaagaggag acttgagtgt tgctgctgaa gcacatcctt 420
gcaatgtggg agtgcacagg agtccaccta aaaaaaaaaa tccttgatac tggtgcctgc 480
cttttttagtc accccgtaac aagggcacac atccaggact gtgt 524

<210> 265
<211> 344
<212> DNA
<213> Homo sapiens

<400> 265
tcctttcttc tacttcagga gatgattcaa agttacttgt ggacatttct ttaagttctg 60
aagacaaatg agacaggatt tggcctgcgg gttcttcaga ctctctacc acctccatta 120
actcttcacg ttggcttgac tagggcaatg cactattttg ctcttttgtt tctggagatg 180
accagcacc acttctttct cttggcgggg ttctaagtgt gtctttgaat accagtgaag 240
actcaggcct atcctgtact ggaaaggagc taaatttgtc tttctgtcta ggaggtgatg 300
cagtagcatc ctctgaggg ggtaaggcca tttctctttt ttga 344

<210> 266
<211> 210
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (78)
<223> n=A,T,C or G

<400> 266
ccacaatgtc cataacttga gcaggctttg gcatcccacc acccccttca gaccaatata 60

cactatgttg gaggaacnac tttaaaatgt aaaatgagaa atgggcactg aacactccat 120
cctcactccc aacagcccac ccacacacct cttcaactgc tatccaaaca tggaggagct 180
cttgtggaag agaggctcaa caccaaataa 210

<210> 267

<211> 238

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(238)

<400> 267

tcggncctcc caccctctna ctgaaattct ntgaaattct cccctttggg atgaggatgg 60
caaccccagg catgtaccct cccaacctgg gaccgcacct aataccctaa catcctgctg 120
acagtggctg ttctcgctgg gcaggcgtcc caaagcacat cgagccagat tcaggcagag 180
tggaactggc ccctcagcca tcagtggagg tggcctggga ggctctaccc tgaacggg 240

<210> 268

<211> 461

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (459)

<223> n=A,T,C or G

<400> 268

tcctcaagga catgcccctt gatagaaact cagttcctgt ctccagttcc ctccctggacc 60
tgatccccca aatgcagggc ctgggactat atccagttcc ttattttcag aggcccatgc 120
acaagatgca cagcaaataa gtgctgaata aagaccacgc tactgctagc ttaccctgct 180
ccaaacattc accaagtcct cagcaaagag ggccatccat tcacctcttc taaaaacaca 240
ctgagctccc cagttctatac cccaagatat gcttggctcc caactatccc tcctctctca 300
tctccaagcc agtttcccct ttctaagtat actgatatta ccaaagacac tgacaatctt 360
cttttcctac ctctccccag tgactagggt tgcagcagga gctctataag tcctagtata 420
cagcagaagc tccataaatg tgtgctgacc taacattang c 461

<210> 269

<211> 434

<212> DNA

<213> Homo sapiens

<400> 269

ctgtgttggt gagcaccgat tcccactcaa tatggcgtgg cttacagtct tcattagggt 60
cccgtcctcca accagaatga ggaatgatca cttcatctgt caaggcatgc agtgcatggt 120
ccacaatctc cattttgatt gagtcatggg atgaaagatt ccacagggtt ccggtataaa 180
cttcagtaag gtccatatca cgagcctttc gaagcaatcg cacaagggca ggcacaccat 240
cacagttttt tatggcaatc ttgttatcct ggtcacgtcc aaaagagata ttcttgagag 300
ctccacaggc tccaagggtc acttcctttt tgggatgggc taacaatccc accagtactg 360
ggatgccctt gagcttccgc acgtcagttc tcaccttggtc attgcggtag cataagtgtt 420
gcagggtatgc aaga 434

<210> 270

<211> 156
<212> DNA
<213> Homo sapiens

<400> 270
ctgcaccagc gattaccagt ggcattcaaa tactgtgtga ctaaggattt tgtatgctcc 60
ccagtagaac cagaatcaga caggatgag ctagtcaaca gcaagtcttt gttggattcg 120
agtaggctca ggatctgctg aaggtcggag gagtta 156

<210> 271
<211> 533
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(533)
<223> n=A,T,C or G

<400> 271
ccactgtcac ggtctgtctg acacttactg ccaaacgcat ggcaaggaaa aactgcttag 60
tgaagaactt agaagctgtg gagaccttg ggccracgtn caccatctgc tctgataaaa 120
ctggaactct gactcanaac cggatgacag tggcccatat gtggtttgac aatcaaattc 180
atgaagctga tacgacagag aatcagagtg gtgtctcttt tgacaagact tcagctacct 240
ggcttgcctt gtccagaatt gcaggtcttt gtaacagggc agtgtttcag gctaaccagg 300
aaaacctacc tattcttaag cgggcagttg caggagatgc ctctgagtca gcactcttaa 360
agtgcataga gctgtgctgt ggntncgtga aggagatgag agaaagatac nccaaaatcg 420
tcgagatacc cttcaactcc accaacaagt accagttgtc tattcataag aacccaaca 480
catcgagacc ccaacacctg ttggtgatga agggcgcccc agaaaggatc cta 540

<210> 272
<211> 630
<212> DNA
<213> Homo sapiens

<400> 272
tgggtatttt cttttctctt tggatgtttt atactttttt ttcttttttc ttctctattc 60
ttttcttcgc ctcccgctac ttctgtcttc cagtttttcca ctccaaactt ctatcttctc 120
caaattgttt catectacca ctcccaatta atctttccat ttctgtctgc gtttagtaaa 180
tgcgttaact aggttttaaa tgacgcaatt ctccctgcgt catggatttc aagggtcttt 240
aatcaccttc ggtttaatct ctttttaaaa gatcgcttc aaattatttt aatcacctac 300
aactttttaa ctaaacttta agctgtttta gtcaccttca ttttaattcta aaagcattgc 360
ccttctattg gtattaattc ggggtctctg agtcctttct ctcaattttc ttttaaatatc 420
attttttact ccatgaagaa gcttcatctc aacctccgtc atgttttaga aaccttttat 480
cttttcttcc ctcatgtctc tcttctaagt ctctcatatt tctcttaaaa tcttaagcta 540
ttaaatttac gttaaaaact taacgctaag caatatctta gtaacctatt gactatattt 600
tttaagtagt tgtattaatc tctatctttc 630

<210> 273
<211> 400
<212> DNA
<213> Homo sapiens

<400> 273
tctggtttgc cctccagttc attctgaatc tagacttgct cagcctaatac aagttcctgt 60

```
acaaccagaa ggcacacagg ttcctttggt atcatccaca agtgaggggt acacagcatc 120
tcaacccttg taccagcctt ctcatgttac agagcaacga ccacagaagg aaccaattga 180
tcagattcag gcaacaatct ctttaaatac agaccagact acagcatcat catcccttcc 240
tgctgcgtct cagcctcaag tatttcagggc tgggacaagc aaacctttac atagcagtgg 300
aatcaatgta aatgcagctc cattccaatc catgcaaacg gtgttcaata tgaatgcccc 360
agttcctcct gttaatgaac cagaaacttt aaaacagcaa 400
```

<210> 274
<211> 351
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (2)
<223> n=A,T,C or G

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<400> 274
tntgagtatg tcccagagaa ggtgaagaaa gcggaaaaga aattagaaga gaatccatat 60
gaccttgatg cttggagcat tctcattcga gaggcacaga atcaacctat agacaaagca 120
cggaagactt atgaacgcct tgttgcccag ttccccagtt ctggcagatt ctggaaactg 180
tacattgaag cagaggttac tattttatct tttttttct tatatcagta ttgcagcatt 240
cactgtagtg atagaaaaca agttaggaac atagccaatt aggacaagga ggatttaaat 300
gtgtcttacc tttattttgt aaaataggta taaaggagta attaaaatga a 360
```

<210> 275
<211> 381
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(381)
<223> n=A,T,C or G

```
<400> 275
gcnnggtcgc nnncgaggtc tgagaagccc ataccactat ttgttgagaa atgtgtggaa 60
tttattgaag atacaggggt atgtaccgaa ggactctacc gtgtcagcgg gaataaaact 120
gaccaagaca atattcaaaa gcagtttgat caagatcata atatcaatct agtgtcaatg 180
gaagtaacag taaatgctgt agctggagcc cttaaagctt tctttgcaga tctgccagat 240
cctttaattc catattctct tcatccagaa ctattggaag cagcaaaaat cccggataaa 300
acagaacgtc ttcatgcctt gaaagaaatt gttaagaaat ttcacctctg aaactatgat 360
gtattcagat acgtgataac a 381
```

<210> 276
<211> 390
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (5)
<223> n=A,T,C or G

<400> 276

gctcngactc cggcgggacc tgctcggagg aatggcgccg ccgggttcaa gcactgtctt 60
cctgttggcc ctgacaatca tagccagcac ctgggctctg acgcccactc actacctcac 120
caagcatgac gtggagagac taaaagcctc gctggatcgc cctttcacia atttggaatc 180
tgccttctac tccatcgtgg gactcagcag ccttggtgct caggtgccag atgcaaagaa 240
agcatgtacc tacatcagat ctaaccttga tcccagcaat gtggattccc tcttctacgc 300
tgcccaggcc agccaggccc tctcaggatg tgagatctct atttcaaag agaccaaaga 360
tctgcttctg gcagacctcg gccgcgacca 390

<210> 277

<211> 378

<212> DNA

<213> Homo sapiens

<400> 277

tgggaacttc tggggtagga cgttgtctgc tatctccagt tccacagacc caaccagtta 60
cgatggtttt ggaccattta tgccgggatt cgacatcatt ccctataatg atctgcccgc 120
actggagcgt gctcttcagg atccaaatgt ggctgcgttc atggtagaac caattcaggg 180
tgaagcaggc gttgtttgtc cggatccagg ttacctaatg ggagtgcgag agctctgcac 240
caggcaccag gttctcttta ttgctgatga aatacagaca ggattggcca gaactggtag 300
atggctggct gttgattatg aaaatgtcag acctgatata gtcctccttg gaaaggccct 360
ttctgggggc ttataccc 378

<210> 278

<211> 366

<212> DNA

<213> Homo sapiens

<400> 278

ggagggcaca ttccttttca cctcagagtc ggtcggggaa ggccaccag ataagatttg 60
tgaccaaacc agtgatgctg tccttgatgc ccaccttcag caggatcctg atgccaaagt 120
agcttggtgaa actgttgcta aaactggaat gatccttctt gctggggaaa ttacatccag 180
agctgctgtt gactaccaga aagtggttcg tgaagctgtt aaacacattg gatatgatga 240
ttcttccaaa ggttttgact acaagacttg taacgtgctg gtagccttgg agcaacagtc 300
accagatatt gctcaagggtg ttcattctga cagaaatgaa gaagacattg gtgctggaga 360
ccaggg 366

<210> 279

<211> 435

<212> DNA

<213> Homo sapiens

<400> 279

cctaagaact gagacttggt acacaaggcc aacgacctaa gattagccca gggttgtagc 60
tggaagacct acaacccaag gatggaaggc ccctgtcaca aagcctacct agatggatag 120
aggacccaag cgaaaaagat atctcaagac taacggccgg aatctggagg cccatgacct 180
agaacccaag aaggatagaa gcttgaagac ctggggaaat cccaagatga gaaccctaaa 240
ccctacctct tttctattgt ttacacttct tactcttaga tatttccagt tctcctgttt 300
atctttaagc ctgattcttt tgagatgtac tttttgatgt tgccggttac ctttagattg 360
acaagtatta tgccctggcca gtcttgagcc agctttaaat cacagctttt acctatttgt 420
taggctatag tgttt 435

<210> 280

<211> 435

<212> DNA

<213> Homo sapiens

<400> 280

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tctggatgag ctgctaactg agcacaggat gacctgggac ccagcccagc caccgccgaga 60
cctgactgag gccttcctgg caaagaagga gaaggccaag gggagccctg agagcagctt 120
caatgatgag aacctgcgca tagtggtggg taacctgttc cttgccggga tggtagaccac 180
ctcgaccacg ctggcctggg gcctcctgct catgatccta cacctggatg tgcagcgtga 240
gccagacct gtccggggcg ccgctcgaaa ttccagcaca ctggcggcg ttactagtgg 300
atccgagctc ggtaccaagc ttggcgtaat catggtcata gctgtttcct gtgtgaaatt 360
gttatccgct cacaattcca cacaacatac gagccggaag cataaagtgt aaagcctggg 420
gtgcctaatag agtga
435

```

<210> 281

<211> 440

<212> DNA

<213> Homo sapiens

<400> 281

```

catctgatct ataaatgctg tggcatcgac aaaagaacca ttgaaaaatt tgagaaggag 60
gctgctgaga tgggaaaggg ctccctcaag tatgcctggg tcttgataa actgaaagct 120
gagcgtgaac gtggtatcac cattgatatc tccttgtgga aatttgagac cagcaagtac 180
tatgtgacta tcattgatgc cccaggacac agagacttta tcaaaaacat gattacaggg 240
acatctcagg ctgactgtgc tgtcctgatt gttgtgctg gtgttgggtga atttgaagct 300
ggatcttcca agaatgggca gacccgagag catgcccttc tggcttacac actgggtgtg 360
aaacaactaa ttgtcggtgt taacaaaatg gattccactg agccccctac agccagaaga 420
gatatgagga aattgttaag
440

```

<210> 282

<211> 502

<212> DNA

<213> Homo sapiens

<400> 282

```

tctgtggcgc aggagcccc tccccggca gctctgacgt ctccaccgca gggactgggtg 60
cttctcggag ctcccactcc tcagactccg gtggaagtga cgtggacctg gatcccactg 120
atggcaagct cttccccagc gatggttttc gtgactgcaa gaagggggat cccaagcacg 180
ggaagcggaa acgaggccgg ccccgaaagc tgagcaaaga gtactgggac tgtctcgagg 240
gcaagaagag caagcacgcg cccagaggca cccacctgtg ggagttcatc cgggacatcc 300
tcatccaccc ggagctcaac gagggcctca tgaagtggga gaatcggcat gaaggcgtct 360
tcaagttcct gcgctccgag gctgtggccc aactatgggg ccaaaaagaa agaacagca 420
acatgacctc cgagaagctg agccgggcca tgaggtacta ctacaaacgg gagatcctgg 480
aacgggtgga tggccggcga ct
502

```

<210> 283

<211> 433

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(433)

<223> n=A,T,C or G

<400> 283

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ccatattaga ttactggaac atctaagcat cagtgtgtga ccatgcgaac aaaagacttc 60
ggggagtgtc tatttttaaa aaggtttatg tgtgtcgagg cagttgtaaa agatttactg 120

```

```

cagaatcaan cccactttta ggcttangac caggttctaa ctatctaaaa atattgactg 180
ataacaaaaa gtgttctaaa tgtggtctatt ctgatccata nttgnttttt aaagaaaaaa 240
antgtntata cagaaagagt ntaaaaagttc tgtgaattna atgcaaatga gncnccantc 300
ttgacttccc aaanacttga ttnatacctt tnaactcctn cnnttcctgn ncttcnttaa 360
nntcaatnat tnggnagttn anggccttcn gnanaacacc nttncncgnt cncgcgaatc 420
cancgcctt nan 433

```

<210> 284

<211> 479

<212> DNA

<213> Homo sapiens

<400> 284

```

tctggaagga tcagggatct gagcaaagcc aagtttactt aagctaagcc acttgttcct 60
gggtcaagca gtttgttttc taataagcat cattcctgat cattagagca aagggatgaa 120
tgctcctctt ggaatgatac aggggatctg ccactgggag agtggttgctc agtggttagag 180
tagcagcaat gacagaatga cagcgactct ctgagtcacac ccagtacttt tagtaccctg 240
tcactatgtg aataaaaggca gctagaaaaat ggactcaatt ctgcaagcct tcatggcaac 300
agcccatatt aagacttcta gaacaagtta aaaaaaaatc ttccatttcc atccatgcat 360
gggaaaaggg ctttagtata gttaggatg gatgtgtgta taataataaa atgataagat 420
atgcatagtg ggggaataaa gcctcagagt ccttcagta tggggaatcc attgtatct 480

```

<210> 285

<211> 435

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(435)

<223> n=A,T,C or G

<400> 285

```

tttttttttt tttttttttt tcaatanaaa tgccataatt tattccattg tataaaaaaag 60
tcatccttat gtaacaaaat gtnttcttan aanaanaaat atattatttc aggtcataaa 120
taatcagcaa acatacaact gttggcaact aaaaaaaaac ccaacactgg tattttccat 180
cagngctgaa aacaaacctg cttaaanata tatttacagg gatagtncag tntcaaaaaa 240
caaaaattga ggtatttttg ttcttctagg agtagacaat gacatttttg gangggcaga 300
cccctnnccc aaaaaataaa ataagggnat nttcttcant atngaannnn gggggcgccc 360
cggggaaaaa naaaccttgg gnnnggggtt tggcccaagc ccttgaaaaa aaantttntt 420
tcccaaaaaa aacng 435

```

<210> 286

<211> 301

<212> DNA

<213> Homo sapiens

<400> 286

```

cctggtttct ggtggcctct atgaatccca tgtaggggtgc agaccgtact ccatccctcc 60
ctgtgagcac cacgtcaacg gctcccggcc cccatgcacg ggggagggag ataccccaaa 120
gtgtagcaag atctgtgagc ctggctacag cccgacctac aaacaggaca agcactacgg 180
atacaattcc tacagcgtct ccaatagcga gaaggacatc atggccgaga tctacaaaaa 240
cggcccgctg gagggagctt tctctgtgta ttcggacttc ctgctctaca agtcaggagt 300
g 301

```

<210> 287
<211> 432
<212> DNA
<213> Homo sapiens

<400> 287
tccagcttgt tggcagcatg agaaccgcca ttgatgacat tgaacgccgg gactggcagg 60
atgacttcag agttgccagc caagtcagcg atgtggcggg acagggggac ccccttctca 120
acggcaccag ctttgcagac ggcaaggagc acccccagaa tggcggttcgc accaaactta 180
gatttatatt ctgttccatc catctcgatc atcagtttgt caatcttctc ttgttctgtg 240
acgttcagtt tcttgctaac cagggcaggc gcaatagttt tattgatgtg ctcaacagcc 300
tttgagacac ccttccccat atagcgagtc ttatcattgt cccggagctc tagggcctca 360
tagataccag ttgaagcacc actgggcaca gcagctctga agagacctt tgaggtgaag 420
agatcaacct ca 432

<210> 288
<211> 326
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (254)
<223> n=A,T,C or G

<400> 288
tctggctcaa gtcaaagtcc tggctctctt ctccgcctcc ttcttcatca tagtaataaa 60
cgttgtcccg ggtgtcatcc tctgggggca gtaagggctc tttgaccacc gctctcctcc 120
gaagaaacag caagagcagc agaatcagaa ttagcaaagc aagaattcct ccaagaatcc 180
ccagaatggc aggaatttgc aatcctgctt cgacaggctg tgccttccta cagacgcccg 240
cggcccttc acantcacac acgctgacct ctaagggtgt cacttggctt ttattctggg 300
tatccatgag cttgagattg attttg 326

<210> 289
<211> 451
<212> DNA
<213> Homo sapiens

<400> 289
gtcccgggtgt ggctgtgccg ttggtcctgt gcggtcactt agccaagatg cctgaggaaa 60
cccagaccca agaccaaccg atggaggagg aggaggttga gacgttcgcc ttccaggcag 120
aaattgcccc gttgatgtca ttgatcatca atactttcta ctgaacaaa gagatctttc 180
tgagagagct catttcaaat tcatcagatg cattggacaa aatccggtat gaaagcttga 240
cagatcccag taaattagac tctgggaaag agctgcatat taaccttata ccgaacaaac 300
aagatcgaac tctcactatt gtggatactg gaattggaat gaccaaggct gacttgatca 360
ataaccttgg tactatcgcc aagctcggga ccaaagcgtt catggaagct ttgcaggctg 420
gtgcagatat ctctatgatt ggacctcggc c 451

<210> 290
<211> 494
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature

<222> (421)

<223> n=A,T,C or G

<400> 290

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tttttttttt tcaaaacagt atattttatt ttacaatagc aaccaactcc ccagtttggt 60
tcaattgtga catctagatg gcttaagatt actttctggt ggtcacccat gctgaacaat 120
atttttcaat ctccaaaaca gcaaagactc aaaagagatt ctgcatttca catcagttca 180
caagttcaag agtcttccat ttatcttagc ttttggaata aattatcttt gaggtagaag 240
gacaatgacg aagccactta attccttggt tctgcataaa agcagattta ttcatcacia 300
cttcatttat gtgaataaag cagatgatga taaaatgttc tcttattctt gtttaatcag 360
tagtggtagt gatgccagaa acttgtaaat gcacttcaaa ccaattgtgg ctcaagtga 420
ngtggttccc caaggctggt accaatgaga ctgggggttg ggaattagtt ggtcatcate 480
cctcctgctg ccca 494
```

<210> 291

<211> 535

<212> DNA

<213> Homo sapiens

<400> 291

```
tcgctgctt aacatgaaaa caaactttgt gctgtttggt tcattgtatg cattgatgga 60
gtcttgcttc tcatcatggg gtgtctgacc atccaacctg cagtactcat aatttctcca 120
catgcaataa tcttccaaaa tgtccaatac ccttgctatt tgactgaaga ttagtactcg 180
tgaaccttgt tcttttaact tagggagcag cttgtctaaa accaccattt tgccactggt 240
ggttactaga tgcataatctg ttgtataagg tggaccaggt tctgctccat caaagagata 300
tggatgatta caacatttct tcaactgcat taggatgttc aataacctca ttttgtccat 360
cttgctgct gagttgagta tatctatata cttcattaat atccgagtat accattccct 420
ttgcattttg ctgaggccca catagatttt tacttccttc tttggaggca aactcttttc 480
aacatcagcc ttaattcgac gaaggaggaa tggacgcaaa accatatgaa gcctc 540
```

<210> 292

<211> 376

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(376)

<223> n=A,T,C or G

<400> 292

```
tacnagcccg tgctgatcga gatcctgggt gaggtgatgg atccttcctt cgtgtgcttg 60
aaaattggag cctgcccctc ggcccataag cccttggttg gaactgagaa gtgtatatgg 120
ggcccaagct actggtgccg gaacacagag acagcagccc agtgcaatgc tgtcgagcat 180
tgcaaacgcc atgtgtggaa ctaggaggag gaatattcca tcttggcaga aaccacagca 240
ttgggttttt tctacttggt tgtctggggg aatgaacgca cagatctggt tgactttggt 300
ataaaaatag ggctccccca cctcccccat ttttgtgtcc tttattgnag cattgctgtc 360
tgcaaggag ccccta 376
```

<210> 293

<211> 320

<212> DNA

<213> Homo sapiens

<400> 293

```

tcggctgctt cctggctctgg cggggatggg tttgctttgg aaatcctcta ggaggctcct 60
cctcgcatgg cctgcagtct ggcagcagcc ccgagttggt tcctcgctga tcgatttctt 120
tcctccaggt agagttttct ttgcttatgt tgaattccat tgctctcttc ctcatcacag 180
aagtgatgtt ggaatcggtt cttttgtttg tctgatttat ggttttttta agtataaaca 240
aaagtgtttt attagcattc tgaaagaagg aaagtaaaat gtacaagttt aacaaaaagg 300
ggccttcccc tttagaatag                               320

```

<210> 294

<211> 359

<212> DNA

<213> Homo sapiens

<400> 294

```

ctgtcataaa ctggtctgga gtttctgacg actccttggt caccaaattgc accatttctt 60
gagacttgct ggcctctccg ttgagtcac ttggctttct gtccctccaca gctccattgc 120
cactgttgat cactagcttt ttcttctgcc cacaccttct tcgactgttg actgcaatgc 180
aaactgcaag aatcaaagcc aaggccaaga gggatgccaa gatgatcagc cattctggaa 240
tttgggggtg ccttatagga ccagagggtg tgtttgctcc accttcttga ctccccatgtg 300
agtgtccatc tgattcagat ccatgagtgg tatgggaccc cccactgggg tgggaatgtg 360

```

<210> 295

<211> 584

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (558)

<223> n=A,T,C or G

<400> 295

```

cctgagttgg gctgactgcc agagacagac ccctctgggt ctcggtgaac cagccaggca 60
tttacctcag tggttggcac ctggaacctg tccaggggccc tcacctgact gaggagccgc 120
cgggcagtgga agtaattgtc caggtctatg ctcttggggg ggataccata gccatccaag 180
gtattcctca ggttgtggaa ctgggtctga gtataggcag aactggggccc caggatgac 240
tcccggagtg ggggaagctg tgaggtcagg taagtatcca cgtccaccgc taccccaatc 300
aaactcagca gaatggtgaa ctggagaagt ccttccgtta agtatttctt cagagaaaagc 360
attgctgaag gaccagaatg tttatgcttt ttgggtttta aaatcttcca aaagacaaat 420
caaggccact gctctgccgc tccagccagc aggttacctt cctcagtgtc aaaccccgta 480
ccccaccctg gcagaacaca agggatgagc tccctgacgg ccccagagga aagcacaccc 540
tgtggagcca aggccaanga cacactccag accacattca cttt                               584

```

<210> 296

<211> 287

<212> DNA

<213> Homo sapiens

<400> 296

```

ccttatcatt cattcttagc tcttaattgt tcattttgag ctgaaatgct gcatttttaat 60
tttaacaaaa acatgtctcc tatcctggtt tttgtagcct tctccacat ccttttctaaa 120
caagatttta aagacatgta ggtgtttgtt catctgtaac tctaaaagat ccttttttaa 180
ttcagtccta agaaagagga gtgcttgctc cctaagagtg tttaatggca aggcagccct 240
gtctgaagga cacttcctgc ctaagggaga gtggtatttg cagacta                               287

```

<210> 297

<211> 457
<212> DNA
<213> Homo sapiens

<400> 297
ccaattgaaa caaacagttc tgagaccgtt cttccaccac tgattaagag tgggggtggca 60
ggtattaggg ataatatcca tttagccttc tgagctttct gggcagactt ggtgaccttg 120
ccagctccag cagccttctt gtccactgct ttgatgacac ccaccgcaac tgtctgtctc 180
atatcacgaa cagcaaagcg acccaaaggt ggatagtctg agaagctctc aacacacatg 240
ggcttgccag gaaccatata aacaatggca gcatcaccag acttcaagaa tttagggcca 300
tcttccagct ttttaccaga acggcgatca atcttttctc tcagctcagc aaacttgcac 360
gcaatgtgag ccgtgtggca atccaatata ggggcatagc cggcgcttat ttggcctgga 420
tggttcagga taatcacctg agcagtgaag ccagacc 457

<210> 298
<211> 469
<212> DNA
<213> Homo sapiens

<400> 298
tctttgactt tccttgctca cctcctctgg agatctcaaa ttctccaggt tccatgctcc 60
cagagatctc aatgattcct gattctcttc ttccaggagt ctgaatgtct cttgggtcac 120
ttccacagac tccagtgggt cttgaatttc cttttctaga ggattcattg ccccttgatt 180
tatttcttct ggagtcacac gtgggtgctg agtttctgga gatttcagtg tttccagggt 240
ctcttgctcc gcagacttca gtgattctag gatctctggt tctaaagatt ttactgcctc 300
tatgctctct tctttgagtg actttaagaa ctcttgattc tcattttcaa gaggtctagc 360
tatctcctgg tcaagagact tcagtgggtc tagatccact tttcttgggg gtcttaatgt 420
catctgatcc tgttccccta gagacctccg tcgctgttga gtctctttt 469

<210> 299
<211> 165
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(165)
<223> n=A,T,C or G

<400> 299
tctgtggaga ggatgaggtt gaggagggtg gggatatnctg ctgctctgac cttaggtaga 60
gtcctccaca gaagcatcaa antggactgg cacatatgga ctcccttcac aggccacaat 120
gatgtgtctc tccttcgggc tggncggta tgcacagttg gggta 165

<210> 300
<211> 506
<212> DNA
<213> Homo sapiens

<400> 300
tctgaggaaa gtttgggctt attagtattt gctccagcga acctccaagt tttctccatt 60
gcggaacaac taactaccag ctctctgggt cagtgggtcg cctccactca gaagtccca 120
gtaggttctg tcattattgt tggcacatag gccctgaata cagggtgatat agggcccca 180
tgagcgctcc tccattgtga aacaaaatat agtatcattc attttctggg ctttctccat 240
cacactgagg aagacagAAC catttagcac agtgacattg gtgaaatag tttcattgat 300

```
tctcacagag taattgacgg agatatatga ttgtgagtcg ggaggtgtca cagttatagg 360
ctcatcagcg gagatgttga agttacctga agcagagacg caagaagagt ctttgttaac 420
atccaagaag gtctttccca tcagggcagg taagacctgg gctgcagcgt ttggattgct 480
gaatgctcct tgagaaattt ccgtga 506
```

```
<210> 301
<211> 304
<212> DNA
<213> Homo sapiens
```

```
<220>
<221> misc_feature
<222> (1)...(304)
<223> n=A,T,C or G
```

```
<400> 301
tcctaaggca gagcccccac cacctcaggc ttctcagttc ccttagccgt cttactcaac 60
tgcccccttc ctctccctca gaatttgtgt ttgtgcctc tatcttgttt tttgtttttt 120
cttctggggg gggctctaga cagtgcctgg cacatagtag gcgctcaata aatacttgtt 180
tgttgaatgt ctctctctc tttccactct gggaaaccta ngntctctgcc attctgggtg 240
acctgtatt tntttctggt gccattcca ttgnccagn taatacttcc tcttaaaaat 300
ctcc 304
```

```
<210> 302
<211> 492
<212> DNA
<213> Homo sapiens
```

```
<400> 302
ttttcagtaa gcaacttttc catgctctta atgtattcct ttttagtagg aatccggaag 60
tattagattg aatggaaaag cacttgccat ctctgtctag gggtcacaaa ttgaaatggc 120
tcctgtatca catacggagg tcttgtgtat ctgtggcaac agggagtttc cttattcact 180
ctttatttgc tgcgttttaa gttgccaaac tccccctcca ataaaaattc acttacacct 240
cctgcctttg tagttctggt attcacttta ctatgtgata gaagtagcat gttgctgcca 300
gaatacaagc attgcttttg gcaaattaaa gtgcatgtca tttcttaata cactagaaag 360
gggaaataaa ttaaagtaca caagtccaag tctaaaactt tagtactttt ccatgcagat 420
ttgtgcacat gtgagagggt gtccagtttg tctagtgtat gttatttaga gagttggacc 480
actattgtgt gt 492
```

```
<210> 303
<211> 470
<212> DNA
<213> Homo sapiens
```

```
<400> 303
tctggggcag caggactctc ctacggcact agtctacagg gggaaggacg ctctgtgctg 60
gcagcgggtg ctacatggc ctgtctgcac tgtaaccaca ggctgggatg tagccaggac 120
ttggtctcct tggagacag gtctgatgtt tggccaatcc agtccttcag acctgcctg 180
aaacttgtat cttacgtgaa cttaaagaat aaaatgcatt tctaccccca tctcgccttc 240
aggactggca cgacaggccc acggcagatt agatcttttc ccagtactga tcgggtgcgtg 300
gaattccagc caccacttct gattcgattc cacagtgate ctgtcctctg agtattttaa 360
agaagccatt gtcacccag tcagtgttcc aggagttggc aaccagccag taggggtgtg 420
cattctccac tccccagccc aggatgcgga tggcatggac ctggccgcg 470
```

```
<210> 304
```


<211> 79
<212> DNA
<213> Homo sapiens

<400> 304
tgtccattg ttaactcagc ctcaaattctc aactgtcagg ccctacaaag aaaatggaga 60
gcctcttctg gtggatgcg 79

<210> 305
<211> 476
<212> DNA
<213> Homo sapiens

<400> 305
tcactgagcc accctacagc cagaagagat atgaggaaat tgtaaggaa gtcagcactt 60
acattaagaa aattggctac aaccccgaca cagtagcatt tgtgccaatt tctgggttga 120
atggtgacaa catgctggag ccaagtgcata acgtaagtgg ctttcaagac cattgtttaa 180
aagctctggg aatggcgatt tcatgcttac acaaattggc atgcttgtgt ttcagatgcc 240
ttggttcaag ggatggaaaag tcacccgtaa ggatggcaat gccagtggaa ccacgctgct 300
tgaggctctg gactgcatcc taccaccaac tcgtccaact gacaagccct tgcgcctgcc 360
tctccaggat gtctacaaaa ttggtggtaa gttggctgta aacaaagttg aatttgagtt 420
gatagagtac tgtctgcctt catagggtatt tagtatgctg taaatatttt taggta 480

<210> 306
<211> 404
<212> DNA
<213> Homo sapiens

<400> 306
tctgtctcgg agctcagggc gcagccagca cacacaggag cccacaggac agccacgtct 60
tcacagaaac tacagaagtc aggacccagg cgaggacctc aggaacaagt gccccctgca 120
gacagagaga cgcagttagca acagcttctg aacaactaca taataatgctg gggagaatcc 180
tgaagaccac tgcattccac aagcactgac aaccacttca ggattttatt tcctccactc 240
taacccccag atccatttat gagaagttag tgaggatggc aggggcatgg aggggtgaagg 300
gacagcaagg atggtctgag ggcttggaaa caatagaaaa tcttcgtcct ttagcatatc 360
ctggactaga aaacaagagt tggagaagag gggggttgat acta 404

<210> 307
<211> 260
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1) ... (260)
<223> n=A,T,C or G

<400> 307
tcctgcctan acatctgtga gggcctcaag ggctgctgcc tcgactttct ccctagctaa 60
gtccacccgt ccagggacac agccagggca ctgctctgtg ctgacttcca ctgcagccaa 120
gggtcaaaaat gaagcatctg cggaggccag gactccttgg catcggacac agtcagggga 180
aaagccaccc tgactctgca ggacagaggg tctagggtca tttggcagga gaacactggg 240
gtgccaaggg aagcnancat 260

<210> 308

<211> 449
<212> DNA
<213> Homo sapiens

<400> 308
tctgtgctcc cgactcctcc atctcaggta ccaccgactg cactgggagg ggccctctgg 60
ggggaaaggc tccacggggc agggatacat ctcgaggcca gtcacacctc ggaggcagcc 120
caatcaggtc aaagattttg cccaactggt cggcttcaga gttccacag aagagaggct 180
ttcgacgaaa catctctgca aagatacagc caacactcca catgtccaca ggtgttgcac 240
atgtggactg cagaagaact tcgggagctc ggtaccagag tgtaacaacc ttgatcgttt 300
cggctggcaa gcctgggtgg ggtgccttgt ccagatatgt ccttaggtcc tgggtctacat 360
gtcacaacac cagggttacc ttgatctccc ggtcagttcg ggtgtggca cagacgtcca 420
tcagccggac aacattggga tgctcaaaa 449

<210> 309
<211> 411
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (384)
<223> n=A,T,C or G

<400> 309
ctgtggaac ctgggggtgcc gggtaaatgg agaactccag cttggatttc ttgccataat 60
caactgagag acgttccatg agcagggagg tgaacccaga accagttccc ccaccaaagc 120
tgtggaatac caagaagccc tgaagaccgg tgacttggtc agccagcttg cgaattcggc 180
ccaacacaag gtcaatgatc tccttgccaa tgggtgtagt ccctcgggca tagttattgg 240
cagcatcttc cttgcctgtg atgagctgct cagggtggaa gagctggcgg taggtgccag 300
tgcgaaactc atcaatgact gtgggttcca agtctacaaa cacagcccgg ggcacgtgct 360
tgccagcgcc cgtctcactt gaanaagggt gtttgaagga agtcatctcc t 420

<210> 310
<211> 320
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (250)
<223> n=A,T,C or G

<400> 310
tcctcgcca gcttgactcg attagtcctc ataaggtaag caaggcagat ggtggctgac 60
cgggaaatgc ctgcctggca gtggacaaac acccttcctc cagcattctt gatggagtct 120
atgaagtcaa tgccctcgtt gaaccaggag ctgatgtctg ccttgtgggt gtccctccaca 180
gggatgctct tgtactggtg gtgacctca aaatgggttg gacaattggc tgagacgttg 240
atcaaggcan ttatgcccac ggcacccagc atgtccttgc gggaagcgtg atacgcactg 300
cccaggtaca gaaagggcag 320

<210> 311
<211> 539
<212> DNA
<213> Homo sapiens

<400> 311

```

tctggcccat gaagctgaag ttgggagaga tgatgcttcg cctctgcttc acaaactcaa 60
aggcctcgtc cagcttgact cgattagctc tcataaggta agcaaggcag atgggtggctg 120
accgggaaat gcctgcctgg cagtggacaa acacccttcc tccagcattc ttgatggagt 180
ctatgaagtc aatggcctcg ttgaaccagg agctgatgtc tgccttggtg ttgtcctcca 240
cagggatgct cttgtactgg tagtgaccct caaaatggtt gggacaattg gctgagacgt 300
tgatcaaggc agttatgcc aaggcatcca gcatgtcctt gcgggaagcg tgatacgcac 360
tgcccaggta cagaaagggc aggatttcca ccgggccacc ctgaaatcca gaaatatcca 420
acattcatca agcttgctca aagccaaggc cagtgcccat acccacaaaa actttctgct 480
ggaaaagtca atttcagata ccgagtgaac tcagttctgt tgctggagga taaataaat 540

```

<210> 312

<211> 475

<212> DNA

<213> Homo sapiens

<400> 312

```

tcaaggatct tcctaaagcc accatgtgag aggattcgga cgagagtctg agctgtatgg 60
cagaccatgt cctgctgttc tagggctatg actgtgtgta ctctaaagtt gccactctca 120
caggggtcag tgatacccac tgaacctggc aggaacagtc ctgcagccag aatctgcaag 180
cagcgcctgt atgcaacgtt tagggccaaa ggctgtctgg tggggttgtt catcacagca 240
taatggccta gtaggtcaag gatccagggt gtgaggggct caaagccagg aaaacgaatc 300
ctcaagtcct tcagtagtct gatgagaact ttaactgtgg actgagaagc attttcctcg 360
aaccagcggg catgtcggat ggctgctaag gcactctgca atactttgat atccaaatgg 420
agttctcgat ccagttttcg aagattgggt ggcactgttg taatgagat cttca 480

```

<210> 313

<211> 456

<212> DNA

<213> Homo sapiens

<400> 313

```

tccacttaaa ggggtgcctct gccaaactggt ggaatcatcg ccacttccag caccacgccca 60
agcctaaccat cttccacaag gatcccgatg tgaacatgct gcacgtgttt gttctgggcg 120
aatggcagcc catcgagtac ggcaagaaga agctgaaata cctgccctac aatcaccagc 180
acgaatactt cttcctgatt gggccgcccgc tgctcatccc catgtatttc cagtaccaga 240
tcatcatgac catgatcgtc cataagaact ggggtggacct ggctggggcc gtcagctact 300
acatccggtt cttcatcacc tacatccctt tctacggcat cctgggagcc ctccctttcc 360
tcaacttcat caggttctctg gagagccact ggtttgtgtg ggtcacacag atgaatcaca 420
tcgtcatgga gattgaccag gaggacctcg gcccgc 456

```

<210> 314

<211> 477

<212> DNA

<213> Homo sapiens

<400> 314

```

tgctgaggct tctggaagcc tggatctgga atcattcacc agattattct ggaaaactat 60
gcgtaccctg gtgttcttct gattggcact gactcccaca ccccaatgg tggcggtctt 120
gggggcatct gcattggagt tgggggtgcc gatgctgtgg atgtcatggc tgggatcccc 180
tgggagctga agtgcaccaa ggtgattggc gtgaagctga cgggctctct ctccggttgg 240
tcctcaccga aagatgtgat cctgaagggt gcaggcatcc tcacggtgaa aggtggcaca 300
ggtgcaatcg tggaatacca cgggcctggg gtagactcca tctcctgcac tggcatggcg 360
acaatctgca acatgggtgc agaaattggg gccaccactt ccgtgttccc ttacaaccac 420

```

aggatgaaga agtatctgag caagaccggc cgggaagaca ttgccaatct agctgat 477

<210> 315

<211> 241

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(241)

<223> n = A,T,C or G

<400> 315

cagggtactgg atgtcaggtc tgcgaaactt cttanatttt gacctcagtc cataaaccac 60
actatcacct cggccatcat atgtgtctac tgtggggaca actggagtga aaacttcggt 120
tgctgcaggt ccgtgggaaa atcagtgacc agttcatcag attcatcaga atgggtgagac 180
tcacagact ggtgagaatc atcagtgatc tctacatcat cagagtcggt cgagtcaatg 240
g 241

<210> 316

<211> 241

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(241)

<223> n = A,T,C or G

<400> 316

nttntgtgat agtgtggttt atggactgag gncaaaatnt aagaagtttc gcagacctga 60
catccaancc tgcccgngcg gncgctcgaa aggnccaatt ctgcagatat ccatcacact 120
ggcggccgct cgagcatgca tctagagggc ccaattcgcc ctatantgag tnatattaca 180
attcactggc cgtcnnttta caacgtcgtg actgggaaaa ccctggcggt acccaactta 240
a 241

<210> 317

<211> 241

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(241)

<223> n = A,T,C or G

<400> 317

aggtaccctg ctcanagcc tgggngcctg ggttgtctcc ttgtccatcc actggtccat 60
tctgtctctgc atttttttgt tctcttttg gaggttccac ttggggttg ggctttgaaa 120
ttatagggt acaantacct cggccgaaac cacnctaagg gcgaattctg cagatatcca 180
tcacactggc gncgctcga gcatgcatct agaggccca attcgcccta tagtgagtcg 240
t 241

<210> 318

<211> 241

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(241)

<223> n = A,T,C or G

<400> 318

```
cgngnacaan ntacattgat gganggtntg nggntctgan tntttantta cantggagca 60
ttaatatattt cttnaacgtn cctcaccttc ctgaantaaa nactctgggt tgtagcgctc 120
tgtgctnana accacntnaa ctttacatcc ctcttttgga ttaatccact gcgcggccac 180
ctctgccgcg accacgctaa gggcnaattc tgcagatata catcacactg gcggccgctc 240
n                                                                 241
```

<210> 319

<211> 241

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(241)

<223> n = A,T,C or G

<400> 319

```
cagggtactga tcggtgcgtg gaantccagc caccantntt gattcgattc cacagtgatc 60
ctgtcctctg agtatatttaa agaagccatt gtcaccccag tcagtgttcc aggagtggc 120
aaccagccag tagggtgtgc cattctccac tcccagccc aggatgcgga tggcatggc 180
accatcatc tctccggtga cgtgttgga cctcggccgc gaccacgcta agggcgaatt 240
c                                                                 241
```

<210> 320

<211> 241

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(241)

<223> n = A,T,C or G

<400> 320

```
ggcaggtacc aacagagctt agtaatntct aaaaagaaaa aatgatcttc ttccgacttc 60
taaacaagtg actatactag cataaatcat tctagtaaaa cagctaaggt atagacattc 120
taataatttg ggaaaacctt tgattacaag tgaaaactca gaaatgcaaa gatgttggtt 180
ttttgtttct cagtctgctt tagcttttaa ctctnnnaan cncatgcaca cttgnaactc 240
t                                                                 241
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<210> 321

<211> 241

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature
<222> (1)...(241)
<223> n = A,T,C or G

<400> 321
angtaccaac agagcttagt aattnntaaa aagaaaaaat gatctttttc cgacttctaa 60
acaagtgact atactagcat aaatcattct agtaaaacag ctaagggtata gacattctaa 120
taatttggga aaacctatga ttacaagtga aaactcagaa atgcaaagat gttgggtttt 180
tgtttctcag tctgctttag cttttaactc tggaagcgca tgcacacntg aactctgctc 240
a 241

<210> 322
<211> 241
<212> DNA
<213> Homo sapiens

<400> 322
ggtaccaaca gagcttagta atttctaaaa agaaaaaatg atctttttcc gacttctaaa 60
caagtgacta tactagcata aatcattctt ctagtaaaac agctaaggta tagacattct 120
aataatttgg gaaaacctat gattacaagt aaaaactcag aaatgcaaag atgttggttt 180
tttgtttctc agtctgcttt agcttttaac tctggaagcg catgcacact gaactctgct 240
c 241

<210> 323
<211> 241
<212> DNA
<213> Homo sapiens

<400> 323
cgagggtactg tcgtatcctc agccttggtc tatttcttta ttttagcttt acagagatta 60
ggtctcaagt tatgagaatc tccatggctt tcaggggcta aacttttctg ccattctttt 120
gctcttaccg ggctcagaag gacatgtcag gtgggatacg tgtttctctt tcagagctga 180
agaaaggggc tgagctgagg aatcagtaga gaaagccttg gtctcagtga ctccttggtt 240
t 241

<210> 324
<211> 241
<212> DNA
<213> Homo sapiens

<400> 324
agggtactgtc gtatcctcag ccttggtcta tttctttatt ttagctttac agagattagg 60
tctcaagtta tgagaatctc catggcttcc aggggctaaa cttttctgcc attcttttgc 120
tcttaccggg ctcagaagga catgtcaggt gggatacgtg tttctcttcc agagctgaag 180
aaagggtctg agctgcggaa tcagtagaga aagccttggt ctcagtgact ccttggtctt 240
c 241

<210> 325
<211> 241
<212> DNA
<213> Homo sapiens

<400> 325
ggcagggtaca tttgttttgc ccagccatca ctcttttttg tgaggagcct aaatacatcc 60
ttcctgggggt ccagagtccc cattcaaggc agtcaagtta agacactaac ttggcccttt 120

cctgatggaa atatttcctc catagcagaa gttgtgttct gacaagactg agagagttac 180
atgttgggaa aaaaaaagaa gcattaactt agtagaactg aaccaggagc attaatgttct 240
g 241

<210> 326

<211> 241

<212> DNA

<213> Homo sapiens

<400> 326

gcaggtacat ttgttttgcc cagccatcac tcttttttgt gaggagccta aatacattct 60
tcctgggggc cagagtcccc attcaaggca gtcaagttaa gacactaact tggcccttct 120
ctgatggaaa tatttcctcc atagcagaag ttgtgttctg acaagactga gagagttaca 180
tggtgggaaa aaaaagaagc attaatctag tagaactgat ccaggagcat taagtctga 240
a 241

<210> 327

<211> 241

<212> DNA

<213> Homo sapiens

<400> 327

ggtaccagac caagtgaatg cgacaggga ttatttcctg tgttgataat tcatgaagta 60
gaacagtata atcaaaatca attgtatcat cattagtttt ccaactgcctc acactagtga 120
gctgtgccaa gtagtagtgt gacacctgtg ttgtcatttc ccacatcacg taagagcttc 180
caaggaaagc caaatcccag atgagtctca gagagggatc aatatgtcca tgattatcag 240
g 241

<210> 328

<211> 241

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(241)..

<223> n = A,T,C or G

<400> 328

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gaacantata atcaaaatca attgtatcat cattagtttt ccaactgcctc acactagtga 120
gctgtgccaa gtagtagtgt gacacctgtg ttgtcatttc ccacatcacg taagagcttc 180
caaggaaagc caaatcccag atgagtctca gagagggatc aatatgtcca tnatcatcan 240
g 241

<210> 329

<211> 241

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(241)

<223> n = A,T,C or G

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<400> 329

ttcagggtcga gttggctgca gatttgtggt gcnttctgag ccgtctgtcc tgcgccaaaa 60
ngcttcaaag tattattaaa aacatatgga tccccatgaa gccctactac accaaagt 120
accaggagat ttggatagga atggggctga tgggcttcat cgtttataaa atccgggctg 180
ctgataagaa gtaaggcttt gaaagcttca gcgcctgctn ctggtcanna ctaaccatan 240
n 241

<210> 330

<211> 241

<212> DNA

<213> Homo sapiens

<400> 330

ttttgtgcag atttgtggtg cgttctgagc cgtctgtcct gcgccaaagat gcttcaaagt 60
attattaaaa acatatggat ccccatgaag ccctactaca ccaaagt 120
tgataggaa tggggctgat gggcttcatc gtttataaaa tccgggctgc tgataaaaga 180
agtaaggctt tgaaagcttc agcgctgct cctggctatc actaaccaga tttacttggg 240
g 241

<210> 331

<211> 241

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(241)

<223> n = A,T,C or G

<400> 331

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ntgcattcct catgactgag gttaacttaa aacaaaaatg gtaggaaagc tttcctatnc 120
ttcnggtaag anacaaatnt nctttaaaaa aangtggaag gcatgacnta cgtgagaact 180
gcacaaactg gccactgaca aaaatgaccc ccatttgtgt gacttcattg agacacatta 240
c 241

<210> 332

<211> 241

<212> DNA

<213> Homo sapiens

<400> 332

tgtgaggaga gggaacatgc tgagaaactg atgaagctgc agaaccaacg aggtggccga 60
atcttccttc aggatatcaa gaaaccagac tgtgatgact gggagagcgg gctgaatgca 120
atggagtgtg cattacattt ggaaaaaat gtgaatcagt cactactgga actgcacaaa 180
ctggccactg acaaaaatga ccccatattg tgtgacttca ttgagacaca ttacctgaat 240
g 241

<210> 333

<211> 241

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1) ... (241)

<223> n = A, T, C or G

<400> 333

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aaatatctta	tcctaatttc	catatagcca	attaattntt	acanaatntt	ttgttaattt	120
ctgngngtat	aaattttaca	aaaataaagg	gtatggttgt	tgcacacaac	ttacaaaata	180
taataaaactn	tttattgnaa	atattnttta	ttgnaaatat	tctttatcct	aaattccata	240
r						241

<210> 334

211 241

<212> DNA

<213> Homo sapiens

<220>

<221> misc feature

$\langle 222 \rangle$ (1) ... (241)

<223> n = A, T, C or G

<400> 334

tacctgctgn	aggggntgaa	gncntctctg	ctgccccagg	catctgcanc	ccctgctgct	60
ggttctgccc	ctgctgcagc	agaggagaag	aaagatgaga	agaaggagga	gtctgaagag	120
tcagatgatg	acatgggatt	tggccttttt	gattaaannc	ctgctcccct	gcaaataaag	180
ctctttttaca	caaaaaaaaa	aaaaaaaaaa	aaaaaaaaaa	aagcttgtag	ctgcccnngc	240
q						241

<210> 335

<211> 241

<212> DNA

<213> Homo sapiens

<220>

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<221> misc_feature
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 $\langle 222 \rangle \quad (1) \dots (241)$

<223> n = A, T, C or G

<400> 335

ctatgtgctg	ggatgactat	ggagacccaa	atgtctcana	atgtatgtcc	cagaaacctg	60
tggctgcttc	aaccattgac	agttttgctg	ctgctggctt	ctgcagacag	tcaagctgca	120
gctcccccac	aggctgtgct	gaaacttgag	ccccctgga	tcaacgtgct	ccaggaggac	180
tctgtgactc	tgacatgcc	gggggctcgc	agccctgaga	gcgactccat	tcagtgggtc	240
c						241

<210> 336

<211> 241

<212> DNA

<213> Homo sapiens

<400> 336

taccaaccta	tgcagccaag	caacctcagc	agttcccatc	aagggcacct	ccaccacaac	60
cgaaagtatc	atctcagggg	aaccttaattc	ctgcccgtcc	tgtccttgca	cctcctttat	120
atagttccct	cacttgattt	ttttaacctt	ctttttgcaa	atgtcttcag	ggaaactgagc	180
taataactttt	ttttttcttg	atgttttctt	gaaaagcctt	tctgttgcaa	ctatgaatga	240
a						241

<210> 337
<211> 241
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(241)
<223> n = A,T,C or G

<400> 337
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taaatggtna atactgactt tttttttatt cccttgactc aagacagcta acttcatttt 120
cagaactggt ttaaaccttt gtgtgctggt ttataaaata atgtgtgtaa tccttggtgc 180
tttcctgata ccagactggt tcccgtggtt ggtagaata tattttgntt tgatgcttat 240
a 241

<210> 338
<211> 241
<212> DNA
<213> Homo sapiens

<400> 338
aggtacaggt gtgcgctgag ccgagtttac acggaaagga taaagcccat ttagtttctt 60
ctcaaattga gttttccact ttcttttgaa gtagacagca ttcaccagga tcatcctggt 120
atccccatct acagaacctt caggtaacaa gtgtgggatt ttgccttttg tttgagtctt 180
gaccacagaa ttaatctttt ttctagcttc ttctgcacat tctaggaagt ctactgcctg 240
g 241

<210> 339
<211> 241
<212> DNA
<213> Homo sapiens

<400> 339
taccgacggc tcctggaggg agagagtga gggacacggg aagaatcaaa gtcgagcatg 60
aaagtgtctg caactccaaa gatcaaggcc ataaccaggg agaccatcaa cggaagatta 120
gttctttgtc aagtgaatga aatccaaaag cagcgtgag accaatgaaa gtttccgcct 180
gttgtaaaat ctattttccc ccaaggaaa tcttgcaca gacaccagtg agtgagttct 240
a 241

<210> 340
<211> 241
<212> DNA
<213> Homo sapiens

<400> 340
gtagccctca cacacacatg cccgtaacag gatttatcac aagacacgcc tgcattgata 60
ccagacacag ggcgtatgga aagcacgtcc tcaagactgt agtattccag atgagctgca 120
gatgcttacc taccacggcc gtctccacca gaaaaccatc gccaaactct gcgatcagct 180
tgtgacttac aaaccttgtt taaaagctgc ttacatggac ttctgtcctt taaaagcttc 240
c 241

<210> 341

<211> 241
<212> DNA
<213> Homo sapiens

<400> 341
gtaccgccta ctttcgtctc atgtctccga acttcttgct gatggccgtt ccaacggtgc 60
tgaaagctgc agttgccttt tgccctgcgt gactcagggt ttcattgtgt ttcttgtagg 120
cagtggtagt ctgcatgtca tgccagcttt tgctgaagt ctgttttaac tcattcatca 180
ggttcatgcc gagttttgtt ttatctcaac tagatgcctt tctttcgctg acaaaacttg 240
t 241

<210> 342
<211> 241
<212> DNA
<213> Homo sapiens

<400> 342
gtacattggt gctataaata taaatgctac ttatgaagca tgaaattaag cttctttttt 60
cttcaagttt tttctcttgt cttagcaatct gttaggcttc tgaaccaaga ccaaatgttt 120
acgttcctct gctgcatacc aacgttactc caaacaataa aaatctatca tttctgctct 180
gtgctgagga atggaaaaatg aaacccccac cccctgaccc ctaggactat acagtggaaa 240
c 241

<210> 343
<211> 241
<212> DNA
<213> Homo sapiens

<400> 343
gtacatgtgg tagcagtaat ttttttgaag caactgcact gacattcatt tgagttttct 60
ctcattatca gattctgttc caaacaagta ttctgtagat ccaaatggat taccagtgtg 120
ctacagactt cttattatag aacagcattc tattctacat caaaaatagt ttgtgtaagt 180
tagttttggg taccatctaa aatattttta aatgttcttc acataaaaat ttatgttgtg 240
t 241

<210> 344
<211> 241
<212> DNA
<213> Homo sapiens

<400> 344
ggtacaaaat tgttgaatt tagctaatag aaaaacatag taaatattta caaaaacgtt 60
gataacatta ctcaagtcac acacatataa caatgtagac aggtcttaac aaagtttaca 120
aattgaaatt atggagattt cccaaaatga atctaatagc tcattgctga gcatggttat 180
caatataaca ttttaagatct tggatcaa atgtgtcccc agtcttctgc aatccagtcc 240
t 241

<210> 345
<211> 241
<212> DNA
<213> Homo sapiens

<400> 345
ggtacgaagc tgagcgcacg ggggttgccc cagcgtggag cctggacctc aaacttcacg 60
gaaaatgctc tctctctttg acaggcttcc agctgtctcc taatttctct gatgaactct 120

ccccggcgat ttaactgac ctgaaaagtg gtgagaggac tgaggaagac aaccagggtca 180
gcgtagatc ggctctgag ggtggtgcc ttgcctgagg agccaccctt taccaccttg 240
g 241

<210> 346

<211> 241

<212> DNA

<213> Homo sapiens

<400> 346

caggtaccac tgagcctgag atggggatga gggcagagag aggggagccc cctcttccac 60
tcagttgttc ctactcagac tgttgcactc taaacctagg gaggttgaag aatgagacct 120
ttaggtttta acacgaatcc tgacaccacc atctatagg tcccaacttg gttattgtag 180
gcaacccttc ctctctcctt ggtgaagaac atcccaagcc agaaagaagt taactacagt 240
g 241

<210> 347

<211> 241

<212> DNA

<213> Homo sapiens

<400> 347

aggtacatct aaaggcatga agcactcaat tgggcaatta acattagtgt ttgttctctg 60
atggtatctc tgagaatact ggttgtagga ctggccagta gtgccttcgg gactgggttc 120
acccccaggt ctgctggcagt tgtcacagcg ccagccccgc tggcctccaa agcatgtgca 180
ggagcaaatt gcaccgagat attccttctg ccactgttct cctacgtggt atgtcttccc 240
a 241

<210> 348

<211> 241

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(241)

<223> n = A,T,C or G

<400> 348

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tgancagagg aggagnncat catcntgtcc tcattcgtca gnnncctctc ctctctgaat 120
ctcaacaag ttgataatgg agaaaaattt gaattctcag gattgaggct ggactgggtc 180
cgcctacang catacactag cgtggctaag gccctctgc accctgcatg anaaccctga 240
c 241

<210> 349

<211> 241

<212> DNA

<213> Homo sapiens

<400> 349

gcaggtagca tttgtctgac ctctgtaaaa aatgtgatcc tacagaagtg gagctggata 60
atcagatagt tactgctacc cagagcaata tctgtgatga agacagtgtc acagagacct 120
gctacactta tgacagaaac aagtgtctaca cagctgtggt cccactcgtc tatgggtggtg 180
agaccaaaat ggtggaaaca gccttaaccc cagatgcctg ctatcctgac taatttaagt 240

c 241

<210> 350
<211> 241
<212> DNA
<213> Homo sapiens

<400> 350
aggctactgtg gatattttaa atatcacagt aacaagatca tgcttggtcc tacagtattg 60
cgggccagac acttaagtga aagcagaagt gtttgggtga ctttcctact taaaattttg 120
gtcatatcat ttcaaaacat ttgcatcttg gttggctgca tatgctttcc tattgatccc 180
aaaccaaatc ttagaatcac ttcattttaa atactgagcg gtattgaata cttcgaagca 240
g 241

<210> 351
<211> 241
<212> DNA
<213> Homo sapiens

<400> 351
tacagaaatc atttgagacc gttttgagac agaagtagag gctctgtcaa gtcaatactg 60
cattgcagct tggccactg aagaagccac gcctgagata caaaagatgc actacacttg 120
accgccttta tgctcgcttc ctctccctt ctctctcctc aactttatta gggtaaaaa 180
ccacatacag gctttctcca aatgactccc tatgtctggg gtttggttag aattttatgc 240
c 241

<210> 352
<211> 241
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(241)
<223> n = A,T,C or G

<400> 352
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acgcaggcgt gnagtgcacg gtctgaccgg gaaacccttt cacttctctg ctcccagagt 120
gtcctcnggc tcatatgtgg gaaggcanan gatctctgan gagttncttg gggacaactg 180
ancagcctct ggagaggggc cattaataaa gctcaacatc attggcaaaa aaaaaaaaaa 240
a 241

<210> 353
<211> 241
<212> DNA
<213> Homo sapiens

<400> 353
aggtagcagt gcattaatct gggcaaggaa agtgtcataa tttgatactg tatctgtttt 60
ccttcaaagt atagagcttt tggggaaggaa aagtattgaa ctgggggttg gtctggccta 120
ctgggctgac attaactaca attatgggaa atgcaaaagt tggttgata tggtagtgtg 180
tggttctctt ttggaatttt tttcagggtg ttttaataata atttaaaact actataaaaa 240
c 241

<210> 354
<211> 241
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(241)
<223> n = A,T,C or G

<400> 354
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ttccagtttc ttctgggat tgaatacttt caagtaagggt cttcgacaaa caatcagggg 120
gcccaattaat ccactgtaga ggtccttaac ttgatccaca gttgaataat aagcccatgg 180
aatacaagca gaatcctctg ttccagctcc agatctttct gggattttcc atacgtaagt 240
g 241

<210> 355
<211> 241
<212> DNA
<213> Homo sapiens

<400> 355
ggtagccacc ctaaatttga actcttatca agaggctgat gaatctgacc atcaaatagg 60
ataggatgga cctttttttg agttcattgt ataaacaaat tttctgattt ggacttaatt 120
cccaaaggat taggtctact cctgctcatt cactctttca aagctctgtc cactctaact 180
tttctccagt gtcatagata gggaattgct cactgcgtgc ctactcttc ttacttacc 240
t 241

<210> 356
<211> 241
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(241)
<223> n = A,T,C or G

<400> 356
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caagaacata tgccagttcc tcgtagagat tggactggct aaggacgacc agctgaagggt 120
tcattgggttt taagtgtctg tggtcactg aagcttaagt gaggatttcc ttgcaatgag 180
tagaatttcc cttctctccc ttgtcacagg tttaaaaacc tcacagcttg tataatgtaa 240
c 241

<210> 357
<211> 241
<212> DNA
<213> Homo sapiens

<400> 357
ttttgtacca ccgatatgat caaggaaaat tctgcccatt tttatggctg aagttctaaa 60
aacctaattc aaagtctctc catgatccta cactgcctcc aagatgggtc aggtcggcat 120
aaggcctgag cggcggtgag atccgcgggt gccagcagct tgctgctctt cagctgggtat 180

gaagccccctc ggccacccga gtctccagga cctgcccggg cgcgcctcga aagggcgaat 240
t 241

<210> 358
<211> 241
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(241)
<223> n = A,T,C or G

<400> 358
aggtacgggg agtgggggtg aagcntgttc tctacatagg caacacagcc gcctaantca 60
caaagtcagt ggtcggccgc ttcgaccaac atgtggtgag cattccacgg gcgcatgaag 120
tctgggtgct gtgctcgagt ctctgaatat tttgatagga agcgacaaga aaattcaaac 180
tgctctttgc tgactactgg aaagtgaaaa gatgctcaag tttaccattc aaagaaacca 240
t 241

<210> 359
<211> 241
<212> DNA
<213> Homo sapiens

<400> 359
gaggtacaca aaaggaatac cttctgagag ccagggagtg aggaaagggg aaggagactt 60
gacgtcaagg gtgcttttga ggaacatgac gggccagcca gcctgcccra actttgaggc 120
cctgctgggc tcttgtgact ataaatatac tgtctatttc taatgcaatc cgtctttcct 180
gaaagatctt gttatctttt actattgaga catgctttca tttttgtggt cctgtttcca 240
a 241

<210> 360
<211> 241
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(241)
<223> n = A,T,C or G

<400> 360
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caacaaattt tgtgattttt ataagaatct atgcctcccc aattctcaga ttcttctctt 120
ttctccttta tttcttttgc taaattcagt ataagctttc ttggtatttt aggttccatg 180
cacattctta ttcctaaaca ccagcagttc ttcagagacc taaaatccag tataggaata 240
a 241

<210> 361
<211> 241
<212> DNA
<213> Homo sapiens

<400> 361

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aggtactctc cgtgccccga cactgaacat tatccagcca gatctgcccc gtgccagctc 60
ccactttgta cttttcttac taccctgtct agaatcatgt cttatgattt taacagatat 120
agaaccactc ctgaaaaatg ttctttcact ttctcgtttc ctttttaatc tatcatcctg 180
actactgaac ttaaaatctt tttcttccct tttttgttcc tcttttcttt tatcctgttc 240
a                                                                 241
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<210> 362

<211> 241

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(241)

<223> n = A,T,C or G

<400> 362

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aattccaaca catatattac tttgtcctat gaaggggcaa aagtcaatat attttaaatt 120
ttaaaaacag aatggatata atgacctttt tacacatcag tgatatttaa aagacttaaa 180
gagacaatac tatggttgag aactgggctt cctattccag ccctaattaa agaaaaaata 240
g                                                                 241
```

<210> 363

<211> 241

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(241)

<223> n = A,T,C or G

<400> 363

```
ttangtacta aaaacaaaat cctaattctg ttttaaagag ctgggagatg ttaatcatat 60
gttcagtttt tccacgttat aatttcctaa atgcaaactt ttcaatcagg gcagttcaaa 120
ttcattacat cacagtaaat aacagtagcc aactttgatt ttatgcttat agggaaaaaa 180
atcctgtaga tataaaaaa gcaaattttg acaaataaaa ctcaaaccat tcatccctaa 240
a                                                                 241
```

<210> 364

<211> 241

<212> DNA

<213> Homo sapiens

<400> 364

```
ggtacaagca gttagtctct aaggcccttg ataagaatgt catcttctcc ccactgagca 60
tctccaccgc cttggccttc ctgtctctgg gggcccataa taccaccctg acagagattc 120
tcaaaggcct caagttcaac ctcacggaga cttctgaggc agaaattcac cagagcttcc 180
agcacctcct gcgcaccttc aatcagtcga gcgatgagct gcagctgagt atgggaaatg 240
c                                                                 241
```

<210> 365

<211> 241

<212> DNA

<213> Homo sapiens

<400> 365

```
cgagggtactg agattacagg catgagccac cacgcccggc caaaaacatt taaaaaatga 60
ctgtccctgc tcaaatactg cagtaggaaa tgtaatttga catatatcac ttccagaaaa 120
aaactttaaa tctttctata aaatgaattt gatacatcat cagcatgaag tgaagttaaa 180
atctcttaca aagtaaattc aggtatatca acaatgagat ccaaagtat cggttcaaga 240
t                                                                 241
```

<210> 366

<211> 241

<212> DNA

<213> Homo sapiens

<400> 366

```
ggcagggtaca catcaaacac ttcattgcct aaatgcaggg acatgcttcc atctgaccac 60
ttgactatcc gagcattgct ttctttaatt tcatttcctt cttcatctcg gcgtatcctc 120
catcttatag tattttctac ctttaatttt aacctgggtc taccttcttc atccagcatt 180
tcttcacctt caaattcatc ttcataatac tgggctctac acttgagaaa gttgggcagt 240
t                                                                 241
```

<210> 367

<211> 241

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(241)

<223> n = A,T,C or G

<400> 367

```
gcagggtacaa ataattcctg ttgtnacatt tagtggacgc gattatctgt atacctcaaa 60
ttttaattta agaaagtatc acttaaagag catctcattt tctatagatt gaggcttaat 120
tactgaaaag tgactcaacc aaaaagcaca taacctttta aaggagctac acctaccgca 180
gaaagtcaga tgccctgtaa ataactttgg tctttcaaaa tagtggcaat gcttaagata 240
c                                                                 241
```

<210> 368

<211> 241

<212> DNA

<213> Homo sapiens

<400> 368

```
tttgtagcatt gttaatagtg accctcggag gaaatggatt tctcttctat taaaaactct 60
atggtatata agcattacat aataatgcta cttaaccacc ttttgtctca agaattatca 120
ccaaagtttt ctggaataaa gtccacataa gaattaaata tttaaaaggt gaaatgttcc 180
ttattttaac tttagcaaga tcttttcttt ttcattaaga aacactttaa taattttaaa 240
g                                                                 241
```

<210> 369

<211> 241

<212> DNA

<213> Homo sapiens

<400> 369

```
gcagggtactt tattcttatt tcttataccta tattctgtgt tacagaaaaa ctactaccat 60
aaacaaaaca ccaaccagcc acagcagttg tgtcaagcat gacaattggc ctagtcttca 120
cattttatta gtaagtctat caagtaagag atgaaggggc tagaaaacta gacacaaagc 180
aaccaggggc caaatcacca aggtagatct gtgcttagct aaagggaac acccgaagat 240
t                                                                 241
```

<210> 370

<211> 241

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(241)

<223> n = A,T,C or G

<400> 370

```
ngttcacagt gcccctccgg cctcgccatg aggetcttcc tgctgctccc ggtcctgggtg 60
gtggttctgt cgatcgtctt ggaaggccca gccccagccc aggggacccc agacgtctcc 120
agtgccttgg ataagctgaa ggagtttggg aacacactgg aggacaaggc tcggggaactc 180
atcagccgca tcaaacagag tgaactttct gccaaagatgc gggagtgggtt ttcagaagac 240
a                                                                 241
```

<210> 371

<211> 241

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(241)

<223> n = A,T,C or G

<400> 371

```
ggcagggtcat cttgagcctt gcacatgata ctcagattcc tcacccttgc ttaggagtaa 60
aacaatatac ttacagggt gataataatc tccatagtta tttgaagtgg cttgaaaaag 120
gcaagattga cttttatgac attggataaa atctacaaat cagccctcga gttattcaat 180
gataactgac aaactaaatt atttccttag aaaggaagat gaaaggmagt ggagtgtggt 240
t                                                                 241
```

<210> 372

<211> 241

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(241)

<223> n = A,T,C or G

<400> 372

```
aggtagacga aagcgaccct tgggtgnata gatcagacgg aaattctctc ccgtcttgnc 60
aatgctgatg acatccatga atccagcagg gtagggtata tcagttcggg ccttgccatc 120
gattttaatg aaccgctgca tgcaaatctt ctttacttca tctcctgtca gggcatactt 180
```

aagctctgttc ctcaggaaaa cgatgagggg gagacactct ctcaacttgt ggggaccggt 240
g 241

<210> 373

<211> 241

<212> DNA

<213> Homo sapiens

<400> 373

tactgaaaca gaaaaaatgt attcccacaa aagctgttac acagcggttt cccgtcccca 60
gaagcagtag aaaatccttag cattccaatg gaaggcatgt atttgtaaaa tattctaaaa 120
tcagctctat agtttccttg tcctctttga taagggatca gacagagggt gtgtccccc 180
tcagcagcta ccttccttga caaactgggc tccaataata cctttcagaa acttacaaga 240
c 241

<210> 374

<211> 241

<212> DNA

<213> Homo sapiens

<400> 374

cagggtactaa aacttacaat aaatatcaga gaagccgtta gtttttacag catcgtctgc 60
ttaaaagcta agttgaccag gtgcataatt tcccatcagt ctgtccttgt agtaggcagg 120
gcaatttctg ttttcatgat cggaatactc aaatatatcc aaacatcttt ttaaaacttt 180
gatttatagc tcctagaaag ttatgttttt taatagtcac tctactctaa tcaggcctag 240
c 241

<210> 375

<211> 241

<212> DNA

<213> Homo sapiens

<400> 375

aggtacaaag gaccagtatc cctacctgaa gtctgtgtgt gagatggcag agaacgggtgt 60
gaagaccatc acctccgtgg ccatgaccag tgctctgccc atcatccaga agctagagcc 120
gcaaattgca gttgccaaata cctatgcctg taaggggcta gacaggattg aggagagact 180
gcctattctg aatcagccat caactcagat tgttgccaat gccaaaggcg ctgtgactgg 240
g 241

<210> 376

<211> 241

<212> DNA

<213> Homo sapiens

<400> 376

ggtacatttt actttccttc tttcagaatg ctaataaaaa acttttgttt atacttaaaa 60
aaaccataaa tcagacaaac aaaagaaacg attccaacat cacttctgtg atgagaaaa 120
aggcaatgga attcaacata agcaaagaaa actctacctg gaggaagaa atcgatcagc 180
gaagaaacaa ctcggggctg ctgccagact gcaggccatg cgaggaggag cctcctagag 240
g 241

<210> 377

<211> 241

<212> DNA

<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(241)
<223> n = A,T,C or G

<400> 377
tcctttctgt ccaggtgatt cacagactag acctttctta tcctcctcct agagttttga 60
cttgggactc tagtgtaag atgatgagcc cgtgcatcag gtccttctgc actttggtgg 120
aagtctccca gggtaggttt cctatttgaa acagtggaat catgtttcca gtgataaagt 180
ttaatgacct catccttttt tttttttttc tcacttgcca tttgtgtgtc ttanatgggt 240
t 241

<210> 378
<211> 241
<212> DNA
<213> Homo sapiens

<400> 378
aggtcagcga tcaggtcctt tatggggcagc tgctgggcag cccacaagc ccagggccag 60
ggcactatct ccgctgcgac tccactcagc ccctcttggc gggcctcacc cccagcccca 120
agtccctatga gaacctcttg ttccaggcca gccccttggg gaccttggtg accccagccc 180
caagccagga ggacgactgt gtctttgggc cactgctcaa cttccccctc ctgcagggga 240
t 241

<210> 379
<211> 241
<212> DNA
<213> Homo sapiens

<400> 379
tacggagcaa tcgaagaggc atatccacac ttgggggtggc tatagggtctg gaaaatgctg 60
aagatgactg ctttctactga ggtcaaggat tgtaatatgg ccagctttgt aaagccatta 120
aagcagaagt ttcttcagtg atcttctctc taagaaacac catcacctcc atgtgcctta 180
cagaggcccc ctgcgttctg ctgcattgct tttgcgcaat cccttgatga tgaagatggg 240
c 241

<210> 380
<211> 241
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(241)
<223> n = A,T,C or G

<400> 380
acgtacacgc agaccgacat gggnnnttca ggcntnagat caaactcaaa acctgnaatg 60
atatccactc tccttttctt aagctcaggg aaatatcca agtagaagtc canaaagtca 120
tcggctaana tccttcngaa ttggaattca tgcacatagg ccttgaaaaa actgtcaaac 180
tgannctgat caccacacaa gtgggcctn tatgacacaa agcagaaacc tttctcttan 240
g 241

<210> 381

<211> 241
<212> DNA
<213> Homo sapiens

<400> 381
aggtaacaact taatggatta gcttttgggt ttaactgaat atatgaagaa attgggtctg 60
tctaaagaga gggatattca tatggctttt agttcacttg tttgtatttc atcttgattt 120
ttttcttttg aaaataaagc attctatttg gttcagattt ctcagatttg aaaaaggctc 180
tatctcagat gtagtaaatt atttcctttc agtttgtgaa agcaggattt gactctgaaa 240
g 241

<210> 382
<211> 241
<212> DNA
<213> Homo sapiens

<400> 382
gtactgctat aatcaatacg tctgatagac aggtttatcc actatattga ccttacctct 60
aaaaggattg tcataattta tatgctttat gtttacacct atgatacagt tgccttggaa 120
cacaaaattt ttcattgtaa ttaaaaaaag aagagttgtg cagacagaag aaatcaaata 180
taagaaaatc acaggagtag ataaatactc tagaattcat atacccttgg aagatggggt 240
t 241

<210> 383
<211> 241
<212> DNA
<213> Homo sapiens

<400> 383
ggcagggtaca aagtcttctc tttgcttttt ataattttta agcaaataac acatttaact 60
gtattttaagt ctgtgcaaat aatccttcag aagaaatata caagattctg tttgcagagg 120
tcattttgtc tctcaaagat gattaaatga gttcgtcttc agataaagtg ctctgtcca 180
gcagaactca aaaggccttc aagctgttca gtaagtgtag ttcagataag actccgtcat 240
a 241

<210> 384
<211> 241
<212> DNA
<213> Homo sapiens

<400> 384
ggtaacaaaa atacacttgc aagcttgctt acagagacct gttaaacaaa gaacagacag 60
attctataaa atcagttata tcaacatata aaggagtgtg attttcagtt tgttttttta 120
agtaaatatg accaaactga ctaaataaga aggcacaaaca aaaaattatg cttccttgac 180
aaggcctttg gagtaaacia aatgctttta ggctcctggg gaatgggggt gcaaggatga 240
a 241

<210> 385
<211> 241
<212> DNA
<213> Homo sapiens

<400> 385
ggcagggtcta caatggctct gtcccttctg tggaaatcgtt acaccaagag gtctcagtc 60
tggtccctga cccacagtg agctgtttag atgaccttc acatcttctt gatcaactgg 120

aagacactcc aatccctcagt gaagactctc tggagccctt caactctctg gcaccaggta 180
ggtttgaggg ctatgtccct ttaacttata catgcagagt agccaaactt tacctgaaag 240
a 241

<210> 386

<211> 241

<212> DNA

<213> Homo sapiens

<400> 386

aggtaccttt ttctcttcca aaggaacagt ttctaaagtt ttctgggggg aaaaaaaact 60
tacatcaaat ttaaaccata tgtaaactg catattagtt gtgttacacc aaaaaattgc 120
ctcagctgat ctacacaagt ttcaaagtca ttaatgcttg atataaattt actcaacatt 180
aaattatctt aaattattaa ttaaaaaaaa aactttctaa gggaaaaata aacaaatgta 240
g 241

<210> 387

<211> 241

<212> DNA

<213> Homo sapiens

<400> 387

acccactgg ccgctgtgga gtatctccac tctccctctg tgagggccgc tcccaccgac 60
cagtcgaact ttcgtaaatg gagttaatgt gtttccactc cccctttccc ctttctggcc 120
ttttggtcca gaatttctct gcttccgggc atatcctggg agtctctgac ttccaggaaa 180
gccaatgtct ccccgatcac ctttaagacc cggaggacct attggacctg gaaatcctcg 240
t 241

<210> 388

<211> 241

<212> DNA

<213> Homo sapiens

<400> 388

tttgtactct tgtccacagc agagacattg agtataccat tggcatcaat gtcaaaagtg 60
acttcaatct gaggaacacc tcggggtgca ggagggtatgc ctgtgagttc aaacttgcca 120
agcaggttgt tatcctttgt catggcacgc tcgcttctat aaacctgaat aagtacacca 180
ggctgggtgt cagaataggt agtgaaggtc tgtgtctgct tggtaggaat ggtggtatta 240
c 241

<210> 389

<211> 241

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(241)

<223> n = A,T,C or G

<400> 389

tacctntgtt agtgagcacc ttgtcttntg tgcttatntc ttnaagataa atacatggaa 60
ggatgtgaaa atcggaacac caactatgtg tctcactgca tctaagttaa gcagccacag 120
ctgtgagagt tttaaagca gaaagatgct gatgtgacct ctggaattca gacatactga 180
gctatgggtc agaagtgttt tacttaaaaa gcaaacatc cccaggaaat actgaatag 240

a 241

<210> 390
<211> 241
<212> DNA
<213> Homo sapiens

<400> 390
gcaggtagcat ccacatgttc ctccaaatga cgtttggggt cctgcttgcc aacattcttt 60
attgccagct gttcagggtgt catcttatct tcttcttcta cagccttatt gtaattcttg 120
gctaattcca acatctcttt taccactgat tcattgcgtt tacaatgttc actgtagtcc 180
tgaagtgtca aaccttccat ccaactcttc ttatgcaa atagcaacat cttctgttcc 240
a 241

<210> 391
<211> 241
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(241)
<223> n = A,T,C or G

<400> 391
cnggcacaan cttntgtttt tnnntttttt tttttttttn tctttatttn tttttantnt 60
taaaaaaa nntannnaa annnggggtt aaatnctn nncagancat taaaactgaa 120
ggggaaaaaa aaacaaaaa cgagcttntt anttnacntg ggnttgggnn gntgctgatn 180
tnaagaagca anntttanan cnnngcnnnat ganngagnn tcannttgaa atttnnacc 240
t 241

<210> 392
<211> 241
<212> DNA
<213> Homo sapiens

<400> 392
gaggtagta atggtatcct tagattaaaa ttttgtgctt gataacagct gttttttcta 60
cattagaaat aagatgccac acaagggaact acattccaga tttaaagaaa tgaaaggata 120
ccattagtgt gtataacaga ttattgttca tacttgtaaa gcatcttatg tcattgagaa 180
tataaagaac agtgccttag aagacagtga aaggtaagct ctagcttaat gtctatgatt 240
t 241

<210> 393
<211> 241
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(241)
<223> n = A,T,C or G

<400> 393
ggcaggtaga taagcataat cagttatgga cagcttcttg tataaattgc tattcancaa 60

116

```

tacataaaact gcctnaaaga tttatgctta caggtagaca ttcaatttac caataaaaaca 120
gcatgttctg aaaatatggg cacattttaaa aacatattaa gacagttctg ttaaccataa 180
tagtcccaca gtatgactga gtaataagaa tctacttcaa aagnaaaaaa aaaattaatc 240
a                                                                 241

```

```

<210> 394
<211> 241
<212> DNA
<213> Homo sapiens

```

```

<400> 394
aggtacagca gcagtagatg gctgcaacaa ccttcctcct accccagccc agaaaatatt 60
tctgccccac ccaggatcc gggaccaaaa taaagagcaa gcaggccccc ttcactgagg 120
tgctgggtag ggctcagtgc cacattactg tgctttgaga aagaggaagg ggatttgttt 180
ggcactttaaa aaatagagga gtaagcagga ctggagaggg cagagaagat accaaaattg 240
g                                                                 241

```

```

<210> 395
<211> 241
<212> DNA
<213> Homo sapiens

```

```

<220>
<221> misc_feature
<222> (1)...(241)
<223> n = A,T,C or G

```

```

<400> 395
nggcnggnnc caanatatga aatntnanta tnatacatga tnaaaagctt tatntatttt 60
agtgaagtaat taagtttaca ctgtgaataa ggattaattc ccagatgacc atctacagtt 120
actaccacat agaggggtata cacggatgga tgcattacaa gaatataaaa cttattttcc 180
ttcctgtatc cacatttctt tgcaatgtga atttgcaggc cctctcaaga agtggagtct 240
a                                                                 241

```

```

<210> 396
<211> 241
<212> DNA
<213> Homo sapiens

```

```

<220>
<221> misc_feature
<222> (1)...(241)
<223> n = A,T,C or G

```

```

<400> 396
gaggtacacc ttgaatgaca atgctnggag cccccctgtg gtcacgcagc cctccactgc 60
cattgatgca ccatccaacc tgcgtttcct ggccaccaca cccaattcct tgctgggtatc 120
atggcagccg ccacgtgccg ggattaccgg ctacatcatc aagtatgaga agcctgggtc 180
tcctcccaga gaagtgggtcc ctgcggccccg ccctgggtgtc acagagggcta ctattactgg 240
c                                                                 241

```

```

<210> 397
<211> 241
<212> DNA
<213> Homo sapiens

```


<220>

<221> misc_feature

<222> (1)...(241)

<223> n = A,T,C or G

<400> 397

```

ggcaggtacc agcaggggga tgtgtttctg ggggaattgtg gctctggaag cttcacggtt 60
tcccagaatg tggaaaatat atctgtgcan gatagaaatc ctgcccagag gctgtttctg 120
tctcatttga gctctccttc atgtggcaga gctgactgtg gcggtttagg agcctacatt 180
ttagaaaagc ttacctcaaa gttctgcatt gagcctgagc actggaaagg agataaaata 240
a                                                                 241

```

<210> 398

<211> 241

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(241)

<223> n = A,T,C or G

<400> 398

```

gangtgacca ngacatcacc tnacacntgg aaagcganga nttgaatggt gcntacaang 60
ccntaccnt tgcacannac ctgaacgcgc ctnttgattg ggacagccgt gggaaggaca 120
gttatgaac nantcanctg gatgaccana gtgntgaaac cnacannac angcnntcna 180
cattatataa ncggaaagct aatgatgaga gcaatgatca ttccgatgtn attgatagtc 240
a                                                                 241

```

<210> 399

<211> 241

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(241)

<223> n = A,T,C or G

<400> 399

```

cagagtgaga tgggagtggg agggccaatc tgatacagaa gggggtgaag ggtagggccc 60
ctgagcagcc cacccttac cctgacgaag gcaatcctcc tctggaatgt ctcttccctc 120
ttcagtctgg gttctgcctc agccacgaac tgggaaggag tgaggaacat cccaacggca 180
atgagagtat cccagtgact ccaaacagga angaatcagt gtccanaaag tcagggccct 240
t                                                                 241

```

<210> 400

<211> 241

<212> DNA

<213> Homo sapiens

<400> 400

```

ggtactcttg ctcttttagc tagagtgtat gtgaaaataa agaaatacat cattgtattc 60
acaaccatgt gtcttcattt ataacttttt gtttaaaaaa tttttagttc aagtttagtt 120

```

cattgatatt atcctctgaa tgcagtcgaag gctgggcaga aattctactc atgtgacatc 180
tgccacaggt ctattttgaa gcttttcttc taatgggcaa tgtttgcctt taccaggatt 240
t 241

<210> 401

<211> 241

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(241)

<223> n = A,T,C or G

<400> 401

nncaggctact ttgtagagca gagagaggct ttggttcttc ctttcttcaa tcacgtggag 60
atgtgtcatc acctgggatt tcatctgggc cgccttttct gggcacaacag ccaacacatg 120
ctggtaaatga cggatgggat gtaagcgatc tttgttctca gcacggacat aacgccgtaa 180
ggcctggaga atgcgatgag gccgtggcgg gtcagactgc aaggcagcca ggtagtcttc 240
c 241

<210> 402

<211> 241

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(241)

<223> n = A,T,C or G

<400> 402

ggcagggtcca aaaaaaacct aaaaanngtt tcaggaatgt agagaaatat ccaacttaaa 60
tagcgaaaaa gtgcaccata attactgctg cactgcagtc atttctgcaa ttcccatggt 120
tcttaaataa ctatcttgtc agataacaca caatataaag agcaattatg aaaaacagac 180
atttacatat acttctaaag tcttattggg aatatcctgt ttggccattg ggataaccaa 240
t 241

<210> 403

<211> 241

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(241)

<223> n = A,T,C or G

<400> 403

agggtgtaac taccgcctcc gagacgggat tgatgacgag tcctatgang ccattttcaa 60
gccggtcattg tccaaagtta tggagatggt ccagcctagt gcgggtggtct tacagtgtgg 120
ctcagactcc ctatctgggg atcgggttagg ttgcttcaat ctaactatca aaggacacgc 180
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t 241

<210> 404
<211> 241
<212> DNA
<213> Homo sapiens

<400> 404
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ttctgtcttc ttttcacggc attcaaagta ggaataaact ttgcttgtgt tgggtggata 120
ttgtttatag tgagtaacct tgtaggagtc ggtggccagg aggatgttga actcggcttc 180
tgccgcagga ttcattctcg gccggaggac aaggggcccg cgcgccgcga gctccctgac 240
c 241

<210> 405
<211> 266
<212> DNA
<213> Homo sapiens

<400> 405
ttctgggctg gggagtggag agaaagaagt tgcagggctt acaggaaatc ccagagcctg 60
agggtttctc ccagatttga gaactctaga ttctgcatca ttatctttga gtctatattc 120
tcttgggctg taagaagatg aggaatgtaa taggtctgcc ccaagccttt catgccttct 180
gtaccaagct tgtttccttg tgcattcttc ccaggctctg gctgcccctt attggagaat 240
gtgatttcca agacaatcaa tccaca 266

<210> 406
<211> 231
<212> DNA
<213> Homo sapiens

<400> 406
ttgggtgaaga accattcctc ggcattcctg cggttcttct ctgccatctt ctcatactgg 60
tcacgcatct cgttcagaat gcggctcagg tccacgccag gtgcagcgtc catctccaca 120
ttgacatctc caccacctg gctctcagg gcattcatct cctcctcgtg gttcttcttc 180
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<210> 407
<211> 266
<212> DNA
<213> Homo sapiens

<400> 407
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ttgtgccata atgcagcagt atggaggagg gattttatgg agaaatgggg atagtcttca 120
tgaccacaaa taaataaagg aaaactaagc tgcattgtgg gttttgaaaa gggtattata 180
cttcttaaca attctttttt tcagggaactt ttctagctgt atgactgtta cttgaccttc 240
tttgaagaagc attcccaaaa tgctct 266

<210> 408
<211> 261
<212> DNA
<213> Homo sapiens

<400> 408
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acttttcagg gaattactga actttcttct cagaagatag ggcacagcca ttgccttggc 120

ctcacttgaa gggctctgcat ttgggtctctc tgggtctcttg ccaagtttcc cagccactcg 180
agggagtaat atctggaggg caaagaagag acttatgtta ttggtgaacc tccagccaca 240
gggaggagca tgggcatggg t 261

<210> 409
<211> 266
<212> DNA
<213> Homo sapiens

<400> 409
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ctgtcccaga cccgctgcca ctgaatcggg cagggatccc ggattcccgg gtagatgcc 120
agtaaatgag cagtttagga ggctgtcctg gtttctgctg gtaccaagct aagtagttct 180
tattgttgga gctgtctaaa acactctggc tgggtctgca gttgatgggtg gccctctcgc 240
ccagagacac agccagggag tgtgga 266

<210> 410
<211> 181
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(241)
<223> n = A,T,C or G

<400> 410
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tttngggatg gggacttggt aatttttcta aaggggnnnn ttannnnngg aagaaaaccn 120
ngntccggtt ccagccaaac cngtngctna ctttccacct tntttccacc tccctcnggt 180
t 181

<210> 411
<211> 261
<212> DNA
<213> Homo sapiens

<400> 411
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gatggcctcc caccattcca agcggagagg ccgggcgtct tctgagagtc agggctctagg 120
tgctggagtg cgcacggagg ccgatgtaga ggaggaggcc ctgaggagga agctggagga 180
gctggccagc aacgtcagt accaggagac ctcgtccgag gaggaggaag ccaaggacga 240
aaaggcagag cccaacaggg a 261

<210> 412
<211> 171
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(241)
<223> n = A,T,C or G

<400> 412

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cagagctgta tctgcaggnt cgttaagcata nagaacngttt gaatatcttc cagngatatc 120
ggctctaact gncagagatg ggtcaacaaa cataatcctg gggacatact g 171

<210> 413

<211> 266

<212> DNA

<213> Homo sapiens

<400> 413

ttaggaccaa agatagcatc aactgtatct gaaggaactg tagtttgctg attttatgac 60
atttttataa agtactgtaa ttctttcatt gaggggctat gtgatggaga cagactaact 120
cattttgtta ttgtcattaa aattatcttg ggtctctgtt caaatgagtt tggagaatgc 180
ttgacttggt ggtctgtgta aatgtgtata tatatatacc tgaatacagg aacatcggag 240
acctattcac tcccacacac tctgct 266

<210> 414

<211> 266

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(241)

<223> n = A,T,C or G

<400> 414

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ggaatccatg tgtttgcaaa aaaagtgtgc tanttttaag gnccttcgta taagaatnaa 180
tganacaatt ttctaccaa aggangaaca aaaggataaa tataatacaa aatatatgta 240
tatgggtggt tgacaaatta tataac 266

<210> 415

<211> 266

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(241)

<223> n = A,T,C or G

<400> 415

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tggtctcatt cagctccggt tcccaacgat caaggcgagt tacatgatcc cccatgttgt 180
gcaaaaaagc ggtagctcc ttccggtcctc cgatcgttgt canaagtaag ttggccgcag 240
tgttatcact catggttatg gcagca 266

<210> 416

<211> 878

<212> DNA

<213> Homo sapiens

<400> 416

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tatcacaaaa tgacttgtag acagtagttt acaacgactc ccaagagagg aaaaaaaaaa 120
aaaaagacgc ctcaaaattc actcaacttt tgagacagca atggcaatag gcagcagaga 180
agctatgctg caactgaggg cacatatcat tgaagatgtc acaggagttt aagagacagg 240
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atctgctcag cctgccgcta acagatctca caatcaccaa ctgtgcttta ggactgtcac 360
caaagtccaga ttcgggtgcta accagggtggc atctatgata aacgtcggcc ctcttattta 420
acaaagggct ctgaaggagg tgttctccaa gcaacaagga gactgcttca gtacaagact 480
ttgcaccttg aattcaattg catcaagtgt ggatagcaaa ataagtatct taccattgaa 540
atatgtgttc agcctaagat tttaccacc accagaacaa aagtgagggg gagaggggat 600
ggccagttag gggatggggg agaaaaaaaa atcacaggat taccaccaa gccttgtttt 660
aaaagggctc ccttcactat tcaggaaggg aagtggagg agaaattaac caattcctgc 720
cacagcagcc ctttttggct gcttccacaa tagatacttt atggagtggc acagccaacc 780
ctatctgtga cctgccctgc ggataaacac agccaagcag gtttaattag atcaaagaca 840
caaagggcta ttcctcctt tcataaacac gcagacct 878
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<210> 417

<211> 514

<212> DNA

<213> Homo sapiens

<400> 417

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ttctgacttc tagaagacta aggctggctt gtgtttgctt gtttgccac ctttggctga 60
taccagaga acctggycac ttgctgcctg atgccaccc ctgccagtc ttctccatt 120
caccagcgg gaggtgggat gtgagacagc ccacattgga aaatccagaa aaccgggaac 180
agggatttgc ccttcacaat tctactcccc agatcctctc ccctggacac aggagacca 240
cagggcagga ccctaagatc tggggaaagg aggtcctgag aaccttgagg tacccttaga 300
tccttttcta cccactttcc tatggaggat tccaagtcac cacttctctc accggcttct 360
accagggctc aggactaagg cgttttctcc atagcctcaa cattttggga atcttccctt 420
aatcacctt gctcctcctg ggtgcctgga agatggactg gcagagacct ctttgttgcg 480
ttttgtgctt tgatgccagg aatgccgcct agtt 514
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<210> 418

<211> 352

<212> DNA

<213> Homo sapiens

<400> 418

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agtaggctca ggatctgctg aaggctggag gagttagtcc ccgcaatcaa gagcctgtct 180
tcctgaagcc cttgggtgata ttttgccact cagccaagaa tgaggatgca tccttcagat 240
tctctatgtc ccgaacctgg aacctatcca cgccagcttg cagccaaaac tccagagcat 300
ccttcacctt ggtggaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aa 352
```

<210> 419

<211> 344

<212> DNA

<213> Homo sapiens

<400> 419

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ctggacacca taatcccttt taagtggctg gatgggcaca cctctcccat tgacaagctg 60
ggttaagtca ataggttgac taggatcaac acgacccaaa tcaataagat actgcagtct 120
attgagactc aaaggcttat actggcgtct gaaactatgt ccttcgttaa acccgatttt 180
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tgggattcgg atgtaaaatg gagtctggcc tccctcaaag cccaagcggg gccgggttcc 240
 tctttgcctt tctcctttat ggctctgcc acattttcta cctcttctcc gacctcttgg 300
 tcttctctcc ggtttcttgg agccgggatt cggttttaag ttgg 344

<210> 420

<211> 935

<212> DNA

<213> Homo sapiens

<400> 420

cgaaagtcaa cgtaaagggg ctcaggtgaa ccatgatgat gaccttctgt tgacttttgaa 60
 atattggctc ttgtgggtga caaaagccag acaagctgtg gctgtggtcc gatttttaaga 120
 cgaggtttctc aaagatccaa aggagggaaa gggatttggg aacactgtgt atcatctgag 180
 acacacgtgt cctcatgac tttaatgcct actttaagc cacctaatac tgcccttcat 240
 tgtgttcaga agagatttct acaaaagcac tcagaattct ggaggcagtt gtgattttgc 300
 catgtggcag ttggtttgtg gagggtggca ggtgtgaaag ggtaaaactc cacttctgaa 360
 tgctgcttct gccccctggg acccagcaca ttgttagacc atcttcttga ctgaaaattc 420
 tctcctgatg ctgagccctg caccaccacc ttccttttcc taactatgaa ttgatggcaa 480
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 aaaccgggtt tttgttcaca tagcaggaag tgactccctg ggtggttaatt tatcttgaa 600
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 tggcaattct gaggacttgc cgcttgtctt atgggtgtgt caaggagcgt tcagaactac 780
 ggaaaacttt tactgaaaca gcgaagcaga gtataccggc atgagagggg agatgaacac 840
 tcacctatgt accactcttt gacaataaat atagtatttc tcaaaaaaaaa aaaaaaaaaa 900
 agtaaaaaaaaa ctgaaatcgc aagtcaaaaa atcca 935

<210> 421

<211> 745

<212> DNA

<213> Homo sapiens

<400> 421

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 tgaagccctg tttgagctcc tgggatatgt gagctgttcc tatgcataat ggatattcgg 120
 ggtaacaac agtccccctg ttggcttcta ttctgaatcc ttttctttca ccatggggtg 180
 cctgaagggg ggctgatgca tatggtacaa tggcaccag tgtaaagcag ctacaattag 240
 gagggtgatg gttctgtagc atcctattta aataagccta ttttatcctt tggcccgta 300
 actctgttat ctgctgcttg tactgggtgcc tgtacttttc tgactctcat tgaccatatt 360
 ccacgaccat ggttgtcatc cactacttga tcctacttta catgtctagt ctgtgtggtt 420
 ggtggtgaat aggcttcttt ttacatggtg ctgccagccc agctaattaa tgggtgcagt 480
 ggacttttag caagcgggct cactggaaga gactgaacct ggcatggaat tccatgaagat 540
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 ctactgcgga acctcaaaat cagtagattt ggaagtgatt caaagctaaa ctttttctct 660
 ggccctcctt gtgttcta attgctgcaag tgtaatacta ggatgtccaa gatgccagtt 720
 tttgcttctt tgttagttgt cagac 745

<210> 422

<211> 764

<212> DNA

<213> Homo sapiens

<400> 422

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 gatggcaaaag gtggtggtgc tttcatcttc aggcagaagc ctctgcccac ccccttcaag 120

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ggctgcaggc ccagttctca tgctgccctt ggggtgggcat ctgttaacag aggagaacgt 180
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catcatcatt attaaacttc agaaaagcag cagccatgtt cagtcaggct catgctgcct 300
cactgcttaa gtgcctgcag gagccgcctg ccaagctccc ctctctacac ctggcacact 360
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tttgagacca agaaacactc tgtgtgactc tacacacact tcagggtggtt tgtgcttcaa 480
agtcattgat gcaacttgaa aggaaacagt ttaatggtgg aaatgaacta ccatttataa 540
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taggacgtga cggtagctgg ccctgtgatt cccccagccc ttgcagtcgg ctagggtgaga 660
ggaaaagctc ttacttccg cccctggcag ggacttctgg gttatgggag aaaccagaga 720
tggaatgag gaaaatatga actacagcag aagccccctg gcag 764

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<210> 423

<211> 1041

<212> DNA

<213> Homo sapiens

<400> 423

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caggatgtct gacttcaaat tgaaactccc aaagtaatga gtttggaagg gtgggggtgtg 120
gcctttccag gatgggggtc ttttctgctc ccagcggata gtgaaacccc tgtctgcacc 180
tggttgggcg tgttgcttcc ccaaagggtt tttttttagg tccgtcgctg tcttgtggat 240
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agctcagggc cacagtgcga tgaggaccat ctctcacctt ctctaaatgc aggaagaaac 360
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cggcaacctg cacctgttca tcaatgccta caacaggtat tgggatgtag ttcagccaca 480
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cgtggccctc tcaaccagca ctagggtgctt atctggagct cagctagggg aggagacagc 960
tcagggccat tgggtgcagc cagagactct gtaatcttcc agggagctcg ctcaacctgc 1020
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<210> 424

<211> 1288

<212> DNA

<213> Homo sapiens

<400> 424

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ggacccaagc gaaaaaggta tctcaagact aacggccgga atctggaggc ccatgaccca 180
gaacccagga aggatagaag cttgaagacc tggggaaatc ccaagatgag aaccctaaac 240
cctactctct ttctattgtt tacacttctt actcttagat atttccagtt ctctgtttta 300
tctttaagcc tgattctttt gagatgtact tttgtatgtt gccggttacc tttagattga 360
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ccaaaatcca gtcagtatct aatctggctt ttgttaactt cctcaggag cagacattca 540
tatagggtgat actgtatttc agtcctttct tttagaccca gaagccctag actgagaaga 600
taaaatggtc aggttgttgg ggaaaaaaa gtgccaggct ctctagagaa aaatgtgaag 660
agatgctcca ggccaatgag aagaattaga caagaaatac acagatgtgc cagacttctg 720

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agaagcacct gccagcaaca gcttccttct ttgagcttag tccatccctc atgaaaaatg 780
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cttaagccat ctagatgtca caattgaac aaactgggga gttggttgct attgtaaaat 1260
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<210> 425

<211> 446

<212> DNA

<213> Homo sapiens

<400> 425

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gcctaacatc ttccacaagg atccccgatg gaacatgctg cacgtgtttg ttctgggcca 120
atggcagccc atcgagtacg gcaagaagaa gctgaaatac ctgccctaca atcaccagca 180
cgaatacttc ttcttgattg ggccgcccgt gctcatcccc atgtatttcc agtaccagat 240
catcatgacc atgatcgctc ataagaactg ggtggacctg gcctgggccc tcagctacta 300
catccggttc ttcatcacct acatcccttt ctacggcatc ctgggagccc tcttttctc 360
caacttcac cagttccttg agagccactg gtttgtgtgg gtcacacaga tgaatcacat 420
cgtcatggag attgaccagg aggacc                                     446

```

<210> 426

<211> 874

<212> DNA

<213> Homo sapiens

<400> 426

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tttttttttt tttttttttt ttttttcaat taaagatttg atttattcaa gtatgtgaaa 60
acattctaca atggaaactt ttattaaatg ctgcatgtac tgtgctatgg accacgcaca 120
tacagccatg ctgtttcaga agacttgaaa tgccattgat agtttaaaaa ctctacacc 180
gatggagaaat cgaggaagac aatttaatgt ttcatctgaa tccagaggtg catcaaatta 240
aatgacagct ccacttggca aataatagct gttacttgat ggtatccaag aagaaatgg 300
tggtgatgga taaattcaga aatgcttccc caaaggtggg tggtttttaa aaagttttca 360
ggtcacaacc ctgcagaaa aactgatgc ccaacacact gattcgcggt ccaggaaaca 420
cgggtcttcc aagttccaag gggctggggg tccccaacga tcaagttcct gtgctgtaat 480
caagaggggtc ctttggactg gatagggagc acttgggagc tgtaacacat cagtcataat 540
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tccagagcag caatggcctt tcctgtaaca ggaaaaaagc ctctgctat tcccaagaac 720
cctcgtaatg gcaaaactcc ccaaatgaca cccaggacca cagcaatgat ctgtcggaac 780
cagtagatca catctaaaaa ttcatcctta tcctcccagg ccgcgtcgct ccgcagcacc 840
ttactccaga cggagacttt gagggccccg ttgg                                     874

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<210> 427

<211> 638

<212> DNA

<213> Homo sapiens

<400> 427

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ttgatttttc ttcttgaaag agtaagggtt acctgttaca ttttcaagtt aattcatgta 120
aaaaatgata gtgattttga tgaattttat ctcttgtttg aatctgtcat tcaaaggcca 180
ataatttaag ttgctatcag ctgatattag tagctttgca accctgatag agtaaataaa 240
ttttatgggc gggcgccaaa tactgctgtg aatctatttg tatagtatcc atgaatgaat 300
ttatggaaat agatatattgt gcagctcaat ttatgcagag attaaatgac atcataatc 360
tggatgaaaa cttgcataga attctgatta aatagtgggt ctgtttcaca tgtgcagttt 420
gaagtattta aataaccact cctttcacag tttattttct tctcaagcgt tttcaagatc 480
tagcatgtgg attttaaaag atttgccttc attaacaaga ataacttta aaggagattg 540
tttcaaaata tttttgcaaa ttgagataag gacagaaaga ttgagaaaca ttgtatattt 600
tgcaaaaaca agatgtttgt agctgtttca gagagagt 638

<210> 428

<211> 535

<212> DNA

<213> Homo sapiens

<400> 428

acaagatgat tcttcctcct caatttgaca gatcaaagaa gtatcccttg ctaattcaag 60
tgtatggtag tccttgagcag cagagtgtaa ggtctgtatt tgctgttaat tggatatctt 120
atcttgcaag taagggaagg atggctattg ccttgggtga tggctcgagga acagctttcc 180
aagggtgacaa actcctctat gcagtgatgc gaaagctggg tgtttatgaa gttgaagacc 240
agattacagc tgtcagaaaa ttcatagaaa tgggtttcat tgatgaaaaa agaatagcca 300
tatggggctg gtcctatgga ggatacgttt catcactggc ccttgcattt ggaactggc 360
ttttcaaatg tggatatgca tgggctccag tctccagctg ggaatattac gcgtctgtct 420
acacagagag attcctgggt ctcccaacaa aggatgataa tcttgagcac tataagaatt 480
caactgtgat ggcaagagca gaatatcca gaaatgtaga ctatcttctc atcca 535

<210> 429

<211> 675

<212> DNA

<213> Homo sapiens

<400> 429

actattttca accctgagca ttaactctgc ataccaaggg ggggtgggtc aagaagctgg 60
ttagatcgaa gcacaagcac aagccactga tattctctat gtgatcaggt ttttcaaaaa 120
aaatacatag ttttcaataa ataatgctta attttacaac tttgatacag caatgtcata 180
caccgtttca acacactaca ctctgcatgc tagatagtct acgagaagac gaaactttgc 240
catgcatttt ctttcccccc tagtgctatc aaacacttca tcctccagcg cactgcctca 300
ggtagcttta ccttctctct gtttcacagc aataggccgt gcgctggcat gcaaacctcta 360
aaaaagggtc cccccacaaa ccactcagac ttctacacaa aagggttttt cagcttttct 420
gtctcccaac ctggagtggc taagaaagta agtttcatgt ggccttggaa aatacacact 480
tgttaacagt gtcattgctga aaactgctct aaaacatcag gtgggttctgt cctgggtggc 540
gtcacgaagc attatgggat gccataacca ctaggagtcc caaacgggaa aaaataggcc 600
tccgttttaa aacagtcaat tcaaaaaagg tgccacagaa caaatgcaa agactcttaa 660
accacaaca tatgt 675

<210> 430

<211> 434

<212> DNA

<213> Homo sapiens

<400> 430

acctctgcca gaagtccagc gagaggacct cacagtagag cacaggccac tccgggagtg 60
catcagaaga ttcattctca tggaggaaga aggtttcaaa cgtgaatggg taggagaagt 120

```

gagccacctt gtccattgcc agggacttgg tgggtgcaggt ctgtgttact cctgagagct 180
gctggaatgc tgggcttgac cagtgcagcag ttggcaattc tacaaagaag tggacgtaga 240
gattgtcata ctcatagcct tgggctgaaa cgacctctcc atttacaaag agccggaggg 300
cacctgggac agtcattctca aagtcgggtgc ctacgagggt gctgagatac tccttgtgcc 360
ggccataaag atccttgaac actcgcgctt cccgctcctc ctccctccgc tgtgctggg 420
gggaaacatt gtcg                                     434

```

<210> 431
 <211> 581
 <212> DNA
 <213> Homo sapiens

```

<400> 431
acacaagcct ccagcccgac ccagcggcct aatgaaactc tggcaaccta tcctgggcgt 60
ggccacgagt atccagctcc aagcccaagt gaggcgggga gtcaacttcc ccatgattgc 120
caagtgacca agaccagaag cagggacgat taggctagtt ctgcggcaag gtgaactgga 180
gacctgtctt ctgcccctct tccttggcct gtcccacaga catcccgttg tttaaccac 240
tgcccttgca aggacctgct ctgtccactc caaatcaaag gatacttgca tccttcttac 300
acagactccc atctctctgc tcatagtggc cccaggctgc ccgagaaaaa gaaacttggg 360
tcagtagaag gctcattagt gtgaaggagt gagaggccag gccttcctgt gacataatgc 420
ttctatgctt gtttcctaaa cacttgggtc acacacaata cctgggcagg aagagagaac 480
caagcaccac tggatggctc tggagccagg ggacttctat gcacatacaa ccaacatcac 540
cccactctgc tcatctgtgc ctccaccctg aacagcagag t                                     581

```

<210> 432
 <211> 532
 <212> DNA
 <213> Homo sapiens

```

<400> 432
actccaactc aagttttacaa gttacacctt tgccacagcc ttggctaaat cttgaactag 60
tgcagaattc agctgtggta gagtgctgat cttagcatgc ttcgatgtgg catacttggt 120
cttgacagtc atgtgctttg taagtccttg atttaccatg actacattct tagccagggtg 180
ctgcataact ggaagaagag attcttcagt atatgacagg taatgttgra gaggttgggtg 240
ccattcacca ttatccagaa ttttcagtgc taagcaaaaa gctcctgctg caatttgaga 300
aggaggaaag tgcaccatgt catagtccaa catagttagt tccatcagggt atttggccaa 360
agtatgttgc tcgacatcaa cctctccaat cttagatgct ctccgaagga agtgcaagg 420
tagaggccga cccagaccaa agtttaaagc tcttagaatc ttcatctcca tctgtctgat 480
ttggtgctta gtataagtggt tgtcagtcac aaaagcaaag tcaccaattt ct 532

```

<210> 433
 <211> 531
 <212> DNA
 <213> Homo sapiens

```

<400> 433
acttggtttt acagctcctt tgaaaactct gtgtttggaa tatctctaaa aacatagaaa 60
aactacagt ggttttagaaa ttactaatct tacttctaag tcattcataa accttgtcta 120
tgaaatgact tcttaaatat ttagttagta gactgttaca ggtaataggg acctagcaag 180
ctcttttata tgctaaaagg gcatctatca gattaagtta gaacatttgc tgcagccac 240
atattgagat gacactagggt gcaatagcag ggatagattt tgttgggtgag tagtctcatg 300
ccttgagatc tgtgggtggc ttcaaaatgg tggccagcca gatcaaggat gtagtatctc 360
atagttccca ggtgatattt ttcttattag aaaaatatta taactcattt gttgtttgac 420
acttatagat tgaaatttcc taatttatcc taaattttaa gtggttcttt ggttccagtg 480
ctttatgttg ttgttgtttt tggatgggtg tacatattat atgttctaga a 531

```

<210> 434
<211> 530
<212> DNA
<213> Homo sapiens

<400> 434
acaagagaaa acccctaata aaaggatggc tttagatgac aagctctacc agagagactt 60
agaagttgca ctagctttat cagtgaagga acttccaaca gtcaccacta atgtgcagaa 120
ctctcaagat aaaagcattg aaaaacatgg cagtagtaaa atagaaacaa tgaataagtc 180
tcctcatatc tctaattgca gtgtagccag tgattattta gatttggata agattactgt 240
ggaagatgat gttggtggtg ttcaagggaa aagaaaagca gcattctaaag ctgcagcaca 300
gcagaggaag attcttcttg aaggcagtga tggatgtagt gctaatagaca ctgaaccaga 360
ctttgcacct ggtgaagatt ctgaggatga ttctgatttt tgtgagagtg aggataatga 420
cgaagacttc tctatgagaa aaagtaaaat taaagaaatt aaaaagaaag aagtgaaggt 480
aaaatcccca gtagaaaaga aagagaagaa atctaaatcc aaatgtaatg 530

<210> 435
<211> 677
<212> DNA
<213> Homo sapiens

<400> 435
accttatgat ctaattaata gatattagaa acagtagaaa gacaagttac acgtcaatgc 60
ccaatgacta gagtcaacat taaagagttg taatttaagt aatccaaact gacatctaata 120
tccaaaatca tttataaaat gtatttggct ttggaatcca caggacttca aacaagcaaa 180
gtttcactgc agatagtcac aaagatgcag atacactgaa atacttaaga gccttattaa 240
tgatttttgc tattttggat cttctgtttt tttcttatta tggccgaag cctccttaat 300
accaatttat cagacagaag catgtcatct tgttgttcaa gataatccag taaattttca 360
gtccattcaa gtgcccgttt atggctaata cgcttctctg gattcagttc tgtttttcta 420
ctcttactgg aaggcttttg ctccagcagc ttggtctggt cctcagcact ttcactgtca 480
gtcagcacct gacagcttga gtcactgctc cgagagtcga accactgatc aatattctca 540
atgtcaacat gttcacattc ttctgtgttc tgtaaaactg ttgctaaatt agctgctaaa 600
atggctcctt catcaatgtt catacctgaa ttctcttcat tgccagggaa aagttttttc 660
catgcttttg ttatggg 677

<210> 436
<211> 573
<212> DNA
<213> Homo sapiens

<400> 436
acctcttagg gtgggagaaa tgggtgaagag ttgttcctac aacttgctaa cctagtggac 60
agggtagtag attagcatca tccggataga tgtgaagagg acggctgttt ggataataat 120
taaggataaa atttggccag ttgacagatt ctgtttccag cagtttttac agcaacagt 180
gagtgttcca gtattgtgtt cctgtaaatt taattttgat ccgcaatcat ttggtatata 240
atgctgtttg aagttttgtc ctattggaaa agtcttgtgt tgcaggggtg cagttaagat 300
ctttgtgatg aggaatggga tgggctaatt ttttgccgtt ttcttggaat tgggggcatg 360
gcaaatacag tagggtagtt tagttcttta cacagaacat gataaaactac acctgttgat 420
gtcaccgtct gtcaatgaat attatagaag gtatgaaggt gtaattacca taataacaaa 480
acacctgtct tttagggctg acctttcgtc ctttgacctc ctgagcctcc attccatct 540
tcgctcagac tgcaagtatg tttgtattaa tgt 573

<210> 437
<211> 645

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(645)

<223> n = A,T,C or G

<400> 437

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acaattggta tccatatctt gttgaaattg taatgggaaa acaatatatt tcaatctcta 60
tgtagatagt gggtttttgt ttccataata tattctttta gtttactgta tgagttttgc 120
aggactgcat aatagatcac cacaatcata acatcttagg accacagaca tttatgagat 180
catggcttct gtgggttaga agtatgctca tgtcttaact gggctctctg ctgagtccta 240
tctggctgca atcaagggtg cagctgggct gaattttcat ttggaatctt gactgggaaa 300
gagtctgctt ccaagggtcat gaagtttgct ggcaaaatgt atgtttttat gacagtatga 360
ctgaaatccc aagctatctc ctgactttta gctgggtaat ctgagggcct aaatgttgcc 420
tacagttcct agaggctggg cacagttctt agccatgtgg atttctcaa catggctgct 480
tgcttcatca agtcagcaag aatagcctgt catatcagtg tatatcaggg tcaactcagga 540
taatttcctt actgatgagc caaacactaa ctgatttttag agcttaacta catctgcaaa 600
attcngttca ccagaggcaa gtcatatcca gggaaggaga agtgt 645
```

<210> 438

<211> 485

<212> DNA

<213> Homo sapiens

<400> 438

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acagaattga gagacaagat tgcttgtaat ggagatgctt ctagctctca gataatacat 60
atcttctgatg aaaaagaagg aaaagaaatg tgtgttctgc gaatgactcg agctagacgt 120
tcccaggtag aacagcagca gctcatcact gttgaaaagg ctttggcaat tctttctcag 180
cctacaccct cacttgyttg ggatcatgag cgattaaaaa atcttttgaa gactgttggt 240
aaaaaaaagtc aaactacaa catatttcag ttggaaaatt tgtatgcagt aatcagccaa 300
tgtatttatc ggcatcgcaa ggaccatgat aaaacatcac ttattcagaa aatggagcaa 360
gaggtagaaa acttcagttg ttccagatga tgatgtcatg gtatcgagta ttctttatat 420
tcagttccta ttaagtcat ttttgtcatg tccgcctaatt tgatgtagta tgaaaccctg 480
catct 485
```

<210> 439

<211> 533

<212> DNA

<213> Homo sapiens

<400> 439

```
acagcagttt cctcatccct gcagctgtgt ttgaacaggt catttaccat actgtcctcc 60
aggttcaaca gtatggctcc aaatgatgaa atttcattct gattttctgg ctgaagacta 120
ttctgtttgt gtatgtccac cacagttaact ttatcccttc atctgtggat gggcagaatg 180
aaacatatat ggaaatgttc tgtgcaataa aaacagcagt ggtaacacag atgtaggctc 240
tgagtgtctc actggagact gaagtccaca gatatgcaac aaagcctttg tctccctgat 300
gtttttgcct cctgctggtc atgtgctttc acacatcaag agaggacatt taacatttga 360
gccacagtgt catttgctgt tgtctgatgg ttggttggca gagaatttga actggagatg 420
aactttatta tccaggacgc tgagagtata acatgcatga cagagctttt agagcactgt 480
gatgtaacat gtcaagcaga aatagggagc atgtttacag ccattctatg aaa 533
```

<210> 440

<211> 341

<212> DNA

<213> Homo sapiens

<400> 440

```
catggggtag ggggggtcggg gattcattga attgtggttg gcaggagcaa gccctgctca 60
cactctcaca ctgcgaccca gaattgtcaa agatacagat tgtaaaaatc tacgatccct 120
cagtctcact cacaaaaaat aaaatctcat gtccccaacg aaccagagt cagacgacag 180
ctggagcatt ggcagggaca gtcagaaagg agacaagtga aaacggtcag atggacacag 240
gcgaggagaga aaagacagag ggagagagac catcggaac aatcagaggg gccgagacga 300
tcagaaaagg gtcagcccga gacaggctga gccagagttt c 341
```

<210> 441

<211> 572

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(572)

<223> n = A,T,C or G

<400> 441

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aagtttgagg ataatttatt atgcagcaag agataatata caggacttct canagcactt 60
aatatgttaa tataaatctc caaaaaaaaa gatatacaat gaaacattcc tcttagttat 120
ctggccaagg anactttntt tttttganaa tattcttcaa aaagctgatc taatgatatg 180
gctctggtcc tacaattcca tgtaacttct aaccttgatt ttatctcatg agcaaatcat 240
ttatccttcc agaacctcaa cttttccctt ttacaaagta gaaataaacc atctgccttt 300
acataaatca ttaatacagc cctggatggg cagattctga gctatttttg gctggggggg 360
gggaaatagc ctgtggaggc cctaaaaaga tctacggggc tcgagatggg tctctgcaag 420
gtagcaggtg ggctcagggc ccatttcagt ctttgttccc caggccattt ccacaaaatg 480
gtgagaaata gtgtcttctt ttagcttgct cataactcaa agatgggggg catggacctg 540
ggcctttcta ggctagggca tgaacctcct cc 572
```

<210> 442

<211> 379

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(379)

<223> n = A,T,C or G

<400> 442

```
tcccagctgc actgcttaca cgtcttcctt cgtnttcacc taccctcgagg ctgactcctt 60
ccccagntgt gcagctgccc accgcaaggg cagcagcagc aatgagcctt cctctgactc 120
gctcagctca cccacgctgc tggccctgtg agggggcagg gaaggggagg cagccggcac 180
ccacaagtgc cactgcccga gctggtgcat tacagagagg agaaacacat cttccctaga 240
gggttcctgt agacctaggg aggaccttat ctgtgcgtga aacacaccag gctgtggggc 300
tcaaggactt gaaagcatcc atgtgtggac tcaagtccct acctcttccg gagatgtagc 360
aaaacgcagc gagtgtgta 379
```

<210> 443

<211> 511

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(511)

<223> n = A,T,C or G

<400> 443

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acatgcccc aaaggtctgc ttcattgcta cgattctcta cttaaatacca cattcacagc 60
tattgcctca gacctctctg aggaggggccc aggggttagc tggctttgaa tagcatgtag 120
agcacaggca gtgtggccac aaatgtcaca caggtgacca ggggtgctata gatgggtgtc 180
ctgttgactt gggcttctag tctctgctcc gtgtctgaca gtgccaagat catgctcccc 240
tgctccagca agaagctggg catagccccg tctgctgggt ccaccaggcc tgggtgtgct 300
gcagacttta caagctgaac caccacagcc atttggttac aagtcttttc taggcatca 360
agctgctctc gtaagccttc tagacatgaa tggacttgcc tggaaatgact aagctgctct 420
ttcaaggcag ctgaaaggac atcnacatct ctgtctctgg tcggggggact acctgcctgt 480
gaccacagagt cctgccctgg cccagcagca t 511
```

<210> 444

<211> 612

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(612)

<223> n = A,T,C or G

<400> 444

```
acaggaagaa ttctacagtt aatctatcac agtgttccag caaagcatat gttgaaaact 60
acagttttca atctaacatc taaattttta aaagtagcat ttcagcaaca aacaagctca 120
gagaggctca tggcaaaagt gaaataacag aactattgct cagatgtctg caaagtcaag 180
ctgctgccct cagctccgcc cacttgaagg cttaggcaga cacgtaagggt ggcggtggct 240
ccttggcagc accattcaca gtggcatcat catacggagg tagcagcacc gtatgtcat 300
tgctggtaac ataaaccagg acatcagagg agttcctacc attgatgtat cggtagcagt 360
tccaaacaca gctaatacaag taacccttaa aagtaagat aatgctaata aacagaagaa 420
taataaggac caaacaggta ggattcactg acatgacatc atctctgtag ggaaaattag 480
gaggcagttg ccgtatgtat tcctgaatgg agtttggata aataagcaca gtgattgcaa 540
ccaacanctt cagggcaaaag tcaaagatct ggtaacagaa gaatgggatg atccaggctg 600
cgcgttgctt gt 612
```

<210> 445

<211> 708

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(708)

<223> n = A,T,C or G

<400> 445

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accatcctgt tccaacagag ccattgccta ttcctaaatt gaatctgact ggggtgtgccc 60
ctcctcggaa cacaacagta gaccttaata gtggaaacat cgatgtgcct cccaacatga 120
caagctgggc cagctttcat aatgggtgtg ctgctggcct gaagatagct cctgcctccc 180
```

```

agatcgactc agcttggatt gtttacaata agcccaagca tgctgagttg gccaatgagt 240
atgctgggctt tctcatggct ctgggtttga atgggcacct taccaagctg gcgactctca 300
atatccatga ctacttgacc aaggggccatg aaatgacaag cattggactg ctacttgggtg 360
tttctgctgc aaaactaggg accatggata tgtctattac tcggcttgtt agcattcgca 420
ttcctgctct cttaccccca acgtccacag agttggatgt tcctcacaat gtccaagtgg 480
ctgcagtgggt tggcattggc cttgtatatc aagggacagc tcacagacat actgcagaag 540
tcctgttggc tgagatagga cggcctcctg gtcctgaaat ggaatactgc actgacagag 600
agtcatactc cttagctgct ggcttggccc tgggcatggt ctncctgggg catggcagca 660
atttgatagg tatgntgat ctcaatgtgc ctgagcagct ctatcagt 708

```

<210> 446

<211> 612

<212> DNA

<213> Homo sapiens

<400> 446

```

acaagcaacg cgcagcctgg atcatcccat tcttctgtta ccagatcttt gactttgccc 60
tgaacatggt gggtgcaatc actgtgctta tttatccaaa ctccattcag gaatacatac 120
ggcaactgcc tcctaatttt ccctacagag atgatgtcat gtcagtgaat cctacctggt 180
tggtccttat tattcttctg tttattagca ttatcttgac ttttaagggt tacttgatta 240
gctgtgtttg gaactgctac cgatacatca atggtaggaa ctccctctgat gtcctgggtt 300
atgttaccag caatgacact acggtgctgc taccctcgta tgatgatgcc actgtgaatg 360
gtgctgcaa ggagccaccg ccaccttacg tgtctgccta agccttcaag tgggaggagc 420
tgagggcagc agcttgactt tgcagacatc tgagcaatag ttctgttat tcaactttgc 480
catgagcctc tctgagcttg tttgttgctg aaatgctact ttttaaaatt tagatgttag 540
attgaaaact gtagttttca acatatgctt tgctggaaca ctgtgataga ttaactgtag 600
aattcttcct gt 612

```

<210> 447

<211> 642

<212> DNA

<213> Homo sapiens

<400> 447

```

actgaaagaa ttaaagtcag aagtcttccc aaaacaaaaa gaactgcccc cagagaaaat 60
cctttctgat acttttcatt gctaaaataa aacaggcggg aaatgtggaa aagaaattca 120
acaaaataat gtagcaccag aagaacaagt cctagatgat tcaagttcaa aaggtaagct 180
ccagcaatgt ggaagaggta aagaccaatg tagacaagct gacgaggaat atcttctttt 240
ttggttttct ggaagtagag ttcaggaaaa gcatgaagcc agtaagccag ctgtgatatg 300
tagaaaaact tcatttgaaa tgtcatcagg ttatggggat aagccctcca taagatagtt 360
gggtctgaga ttagtcttcc agagatgaga atgaatgtgc cccaaacaca ggcaaaaagg 420
tagaacgcac taagctgacc agattcatta aacttgctgt gttttgtttt ggagaagtgc 480
attcgctgt taattttatc caacatatac tcttgaatta cggcatgaat aattatcgcc 540
actagcatgt agaagaaaac agtagccaaa tctttgatgc catagtaata aaggacact 600
gattcagtag cttgttcttc tgttgctggg aggtgacat tg 642

```

<210> 448

<211> 394

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(394)

<223> n = A,T,C or G

<400> 448
accagaagac cttagaaaaa ggaggaaagg aggagaggca gataatttgg atgaattcct 60
caaagngttt gaaaatccag aggttcctag agaggaccag caacagcagc atcagcagcg 120
tgatgttatc gatgagccca ttattgaaga gccaaagccg ctcaggaggt cagtgatgga 180
ggccagcaga acaaacatag atgagtcagc tatgcctcca ccaccacctc agggagttaa 240
gcgaaaagct ggacaaattg acccagagcc tgtgatgcct cctcagcagg tagagcagat 300
ggaaatacca cctgtagagc ttccccaga agaacctcca aatatctgtc agctaatacc 360
agagttagaa cttctgccag aaaaagagaa ggag 394

<210> 449
<211> 494
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(494)
<223> n = A,T,C or G

<400> 449
acaaaaaaca caaggaatac aacccaatag aaaatagtcg tgggaatgtg gtcagaagca 60
aaggcntgag tgtctttctc aaccgtgcaa aagccgtgtt cttcccgga aaacaggaaa 120
aggatccgct actcaaaaac caagaattta aaggagtttc ttaaatttcg accttgtttc 180
tgaagctcac ttttcagtgc cattgatgtg agatgtgctg gagtggctat taaccttttt 240
ttcctaaaga ttattgttaa atagatattg tgggttgggg aagttgaatt ttttataggt 300
taaatgtcat ttttagagatg gggagaggga ttatactgca ggcagcttca gccatgttgt 360
gaaactgata aaagcaactt agcaaggctt cttttcatta tttttatgt ttcacttata 420
aagtcttagg taactagtag gatagaaaca ctgtgtcccc agagtaagga gagaagctac 480
tattgattag agcc 494

<210> 450
<211> 547
<212> DNA
<213> Homo sapiens

<400> 450
actttgggct ccagacttca ctgtccttag gcattgaaac catcacctgg tttgcattct 60
tcatgactga ggtaactta aaacaaaaat ggtaggaaaag ctttcctatg cttcggttaa 120
gagacaaatt tgcttttgta gaattgggtg ctgagaaagg cagacagggc ctgattaaag 180
aagacatttg tcaccactag ccaccaagtt aagttgtgga acccaaaggt gacggccatg 240
gaaacgtaga tcatcagctc tgctaagtag ttaggggaag aaacatattc aaaccagtct 300
ccaaatggga tcctgtgggt acagtgaatg gccactcctg ctttattttt cctgagattg 360
ccgagaataa catggcactt atactgatgg gcagatgacc agatgaacat catcatccca 420
agaatatgga accaccgtgc ttgcatcaat agatttttcc ctgttatgta ggcattcctg 480
ccatccattg gcacttggct cagcacagtt aggccaaaca ggacataata gacaagtcca 540
aaacagt 547

<210> 451
<211> 384
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature

<222> (1)...(384)

<223> n = A,T,C or G

<400> 451

```
actacttntt gggttaaaang ccactggtag agtcatctga ntgtaaacia tgtccctgca 60
ctgctggaaa aatccactgg ctcccaagaa aagaaaatgg tctgaagcct ctgttgtggc 120
tctcacaaact catctttccc taagtcacat agctccacat cactgagggtc aatgtcatcc 180
tccacgggaa gctcgccatc cctgccgtcc caaggctctc tctcaacgat ggtaggggaaa 240
gccccgcctc ctacagggtgc cgtggagcca cgcacaaaag agagctccct gagaaactcg 300
ttgatgcctt gctcactgaa ggagcctttt agcagagcaa atttcatctt gcgtgcattg 360
atggcggcca tggcggggta ccca 384
```

<210> 452

<211> 381

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(381)

<223> n = A,T,C or G

<400> 452

```
actctaaagt tgccactctc acaggggtca gtgataccca ctgaacctgg caggaacagt 60
cctgcagcca gaatctgcaa gcagcgcctg tatgcaacgt ttagggccaa aggctgtctg 120
gtgggggttg tcatcacagc ataatggcct agtaggtcaa ggatccaggg tgtgaggggc 180
tcaaagccag gaaaacgaat cctcaagtcc ttcagtagtc tgatgagaac tttaactgtg 240
gactgagaag cattttcctc gaaccagcgg gcatgtcggg tggctgctaa ngcactctgc 300
aatactttga tatccaaatg gaggctctga tccagttttc naagattggg tggcactgtt 360
gtaatganaa tcttactgtt a 381
```

<210> 453

<211> 455

<212> DNA

<213> Homo sapiens

<400> 453

```
actgtgctaa acagcctata gccaggtttt aaagagttac aggaacaact gctacacatt 60
caaagaacag gcattcactg cagcctcctg atttgacctg atgggagggg caggagaatg 120
agtcactctg ccaccacttt tcttgccctg gattttaga ggatttgtt tgcctctaatt 180
tgtttttctt atatctgccc tactaaggta cacagtctgg gcactttgaa aatgtttaaag 240
tttttaacgt ttgactgaca gaagcagcac ttaaaggctt catgaatcta ttttccaaaa 300
aaagtatgct ttcagtaaaa cattttacca ttttatctaa ctatgcactg acatttttgt 360
tcttcctgaa aaggggattt atgctaacac tgtattttta atgtaaaaat atacgtgtag 420
agatatttta acttcctgag tgacttatac ctcaa 455
```

<210> 454

<211> 383

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(383)

<223> n = A,T,C or G

<400> 454
acagagcanc tttacaagtt gtcacatttc tttataaatt tttttaaagc tacagtttaa 60
tacaaaaatga attgcggttt tattacatta ataacccttc acctcagggt tttatgaaga 120
ggaaaggggtt ttatgcaaaa gaaagtgcga caattcctaa tcattttaga cacttttagga 180
gggggtgaag ttgtatgata aagcagatat ttttaattatt tggtatcttt ttgtattgca 240
agaaatttct tgctagtga tcaagaaaac atccagattg acagtctaaa atggctactg 300
gtatttttagt taattcaaaa atgaaacttt tcagtgatc actttactaa cattctattt 360
gagaaggctt attggtaaag ttt 383

<210> 455
<211> 383
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(383)
<223> n = A,T,C or G

<400> 455
actcctttan gacaaggaaa cagggtatcag catgatggta gcagaaacct tatcaccaag 60
gtgcaggagc tgacttcttc caaagagttg tgggtccggg cagcgggtcat tgccgtgccc 120
attgctggag ggctgatttt agtggtgctt attatgttgg ccctgaggat gcttcgaagt 180
gaaaataaga ggctgcagga tcagcggcaa cagatgctct cccggttgca ctacagcttt 240
cacggacacc attccaaaaa ggggcaggtt gcaaagttag acttggaatg catgggtgccg 300
gtcagtgggc acgagaactg ctgtctgacc tgtgataaaa tgagacaagc agacctcagc 360
aacgataaga tcctctcgct tgt 383

<210> 456
<211> 543
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(543)
<223> n = A,T,C or G

<400> 456
acaaacattt tacaaaaaag aacattacca atatcagtgg cagtaagggc aagctgaaga 60
atangtagac tgagtttccg ggcaatgtct gtcctcaaag acatccaaac tgcgttcagg 120
cagctgaaac aggttctttt cccagtgaac agcatatgtg gtcagtaata caaacgatgg 180
taaagtgggc tactacatag gccaggttaa caaactcttc ttctcctcgg gtaggccatg 240
atacaagtgg aactcatcaa ataatttaaa cccaaggcga taacaacact atttcccatc 300
taaactcatt taagccttca caatgtcgca atggattcag ttacttgcaa acgatcccg 360
gttgatcatc agatacttgt tttttacaca taacgctgtg ccaccccttc cttcactgcc 420
ccagtccagg ttctctgtgt tggaccgaaa ggggatacat tttagaaatg cttccctcaa 480
gacagaagtg agaaagaaag gagaccctga ggcaggatc tattaacact ggtgtgtgcg 540
caa 543

<210> 457
<211> 544
<212> DNA
<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(544)

<223> n = A,T,C or G

<400> 457

```
actggtgccat atattgncat ggtgagctcc tctctaattgt cttccagggc accaatatct 60
gcccatgtca cattagggac agtgacaaag ccttcccttt tggcagaggg ttggactgag 120
gatagagcaa caatgaaatc attcagttca atgcacagtc cttgcatctg ctccctctgag 180
aggggatctt ggtctcttag caaccccagc agcctttgta attcatcctg tgtttcagaa 240
gtgggctcag ttcccagcct ttccctctgg actccttttag atggcaaate ttccatttca 300
ggatttttct tctgctgttc ctgtagcttc attaagactc tattgactgc acacattgct 360
gcctctcggc acagtgccat gagatcagca ccaacaaagc ctggagttag gtgtgctaag 420
tgacagaaat caaaagcttg aggaagcctc agttttctgc acaatgtttg aagtattctt 480
tccctggatg cttcatctgg gatacctagg catatttctc ggtcgaacct tcccgcacgt 540
ctca                                         544
```

<210> 458

<211> 382

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(382)

<223> n = A,T,C or G

<400> 458

```
acctntaggc tcaacggcag aanccttcacc acaaaagcga aatgggcaca ccacagggag 60
aaaactgggt gtccctggatg ttgaaaagt tggctgtgtg catggtgtgt tacttcatcc 120
tatctatcat taactccatg gcacaaagt atgccaaacg aatccagcag cgggtgaact 180
cagaggagaa aactaaataa gtagagaaaag ttttaaactg cagaaattgg agtggatggg 240
ttctgcctta aattgggagg actccaagcc gggaaggaaa attccctttt ccaacctgta 300
tcaattttta caactttttt cctgaaagca gtttagtcca tactttgcac tgacatactt 360
tttccttctg tgctaaggta ag                                         382
```

<210> 459

<211> 168

<212> DNA

<213> Homo sapiens

<400> 459

```
ctcgtaactct agccaggcac gaaaccatga agtagcctga tccttcttag ccatacctggc 60
cgccttagcg gtagtaactt tgtgttatga atcacatgaa agcatggaat cttatgaact 120
taatcccttc attaacagga gaaatgcaaa taccttcata tccctca                                         168
```

<210> 460

<211> 190

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(190)

<223> n = A,T,C or G

<400> 460

```
acancctgcta ccagggagcc gagagctgac tatcccagcc tcggctaatag tattctacgc 60
catggatgga gcttcacacg atttcctcct gcggcagcgg cgaaggtcct ctactgctac 120
acctggcgctc accagtggcc cgtctgcctc aggaactcct ccgagtgagg gaggaggggg 180
ctcctttccc                                     190
```

<210> 461

<211> 495

<212> DNA

<213> Homo sapiens

<400> 461

```
acagacaggc ttctctgcta tcctccaggc agtgtaatag tcaaggaaaa gggcaacagt 60
attggatcat tccttagaca ctaatcagct ggggaaagag ttcattggca aaagtgtcct 120
cccaagaatg gtttacacca agcagagagg acatgtcact gaatggggaa agggaacccc 180
cgtatccaca gtcactgtaa gcatccagta ggcaggaaga tggctttggg cagtggctgg 240
atgaaagcag atttgagata ccagctccg gaacgaggtc atcttctaca ggttcttctc 300
tcactgagac aatgaattca gggatgatcat tctctgaggg gctgagaggt gcttctctga 360
ttttcactac cacattagct tggctctctg tctcagaggg tatctctaag actaggggct 420
tgggtatatat gtggctcaaaa cgaattagtt cattaatggc ttccagcttg gctgatgacg 480
tccccactga cagag                                     495
```

<210> 462

<211> 493

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(493)

<223> n = A,T,C or G

<400> 462

```
acactgaaac ataaatccgc aagtcaccac acatacaaca cccggcagga aaaaaacaaa 60
aacagggngt ttacatgac cctgtaacag ccattggtctc aaactcagat gcttcctcca 120
tctgccaagt gtgttttggg tacagagcac atcgtggctt ctgggggtcac actcagctta 180
ggctgtgggt ccacagagca ctcatctggc tgggctatgg tgggtggggc tctactcaag 240
aagcaaagca gttaccagca cattcaaaca gtgtattgaa catcttttaa atatcaaagt 300
gagaaacaag aaggcaacat aataatgtta tcagaaagat gttaggaagt aaggacagct 360
gtgtaaaagct tgaggctgaa aagtagcttg ccagcttcat ttctttgggt tcttgggtag 420
tgggcgcggg aacagcaaga tgtgaggttc tgggtcatgg atcatataat ggacccatcc 480
ctgactctgc tga                                     493
```

<210> 463

<211> 3681

<212> DNA

<213> Homo sapiens

<400> 463

```
tccgagctga ttacagacac caaggaagat gctgtaaaga gtcagcagcc acagccctgg 60
ctagctggcc ctgtgggcat ttattagtaa agttttaatg acaaaagctt tgagtcaaca 120
caccctgggg taattaacct ggtcatcccc accctggaga gccatcctgc ccatgggtga 180
tcaaagaagg aacatctgca ggaacacctg atgaggctgc acccttggcg gaaagaacac 240
```

```

ctgacacagc tgaaagcttg gtggaaaaaa cacctgatga ggctgcaccc ttgggtggaaa 300
gaacacctga cacggctgaa agcttggttg aaaaaacacc tgatgaggct gcatccttgg 360
tggagggaaac atctgacaaa attcaatgtt tggagaaagc gacatcttga aagttcgaac 420
agtcagcaga agaaacacct agggaaatta cgagtcctgc aaaagaaaca tctgagaaat 480
ttacgtggcc agcaaaagga agacctagga agatcgcatg ggagaaaaaa gaagacacac 540
ctaggggaaat tatgagtcct gccaaaagaa catctgagaa atttacgtgg gcagcaaaaag 600
gaagacctag gaagatcgca tgggagaaaa aagaaacacc tgtaaagact ggatgcgtgg 660
caagagtaac atctaataaa actaaagtct tggaaaaagg aagatctaag atgattgcat 720
gtcctacaaa agaatacatc acaaaagcaa gtgccaatga tcagaggctc ccatacagaat 780
ccaaacaaga ggaagatgaa gaataattct gtgattctcg gagtctcttt gagagtctcg 840
caaagattca agtgtgtata cctgagtcta tatatcaaaa agtaatggag ataaatagag 900
aagtagaaga gcctcctaag aagccatctg ccttcaagcc tgccattgaa atgcaaaact 960
ctgttccaaa taaagccttt gaattgaaga atgaacaaac attgagagca gatccgatgt 1020
tcccaccaga atccaaacaa aaggactatg aagaaaattc ttgggattct gagagtctct 1080
gtgagactgt ttcacagaag gatgtgtgtt tacccaaggc tacacatcaa aaagaaatag 1140
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tcccaataaa agccttgga tggaaaaatg aacaaacatt gagagcagat gagatactcc 1380
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aaataaatgg aaaattagaa gggctctctg ttaaagatgg tcttctgaag gctaactgcg 1560
gaatgaaagt ttctattcca actaaagcct tagaattgat ggacatgcaa actttc aaag 1620
cagagcctcc cgagaagcca tctgccttcg agcctgccat tgaatgcaa aagtctgttc 1680
caaataaagc cttggaattg aagaatgaac aaacattgag agcagatgag atactcccat 1740
cagaatccaa acaaaaggac tatgaagaaa gttcttgagg ttctgagagt ctctgtgaga 1800
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aatcaaaaca aaagaasgtt gaagaaaatt cttgggattc tgagagctct cgtgagactg 2160
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tgaaaaagaa gttttgtgta ctgaaaaaga aactgtcaga agcaaaaagaa ataaaatcac 2400
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gctaaaactg gaaatagcca cactgaaaca ccaataccag gaaaaggaaa ataaatactt 2580
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tctaagagaa aatacattgg tttcagaaca tgcacaaaaga gaccaacgtg aaacacagt 3060
tcaaataag gaagctgaac acatgtatca aaacgaacaa gataatgtga acaaacacac 3120
tgaacagcag gagtctctag atcagaaatt atttcaacta caaagcaaaa atatgtggct 3180
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tattcatttt cttgagagga aaatgcaaca tcatctccta aaagagaaaa atgaggagat 3300
atttaattac aataaccatt taaaaaaccc tatatatcaa tatgaaaaag agaaagcaga 3360
aacagaaaac tcatgagaga caagcagtaa gaaacttctt ttggagaaac aacagaccag 3420
atctttactc acaactcatg ctaggaggcc agtcttagca tcaccttatg ttgaaaatct 3480
taccaatagt ctgtgtcaac agaatactta ttttagaaga aaaattcatg atttcttctt 3540

```

gaagcctaca gacataaaat aacagtgtga agaattactt gttcacgaat tgcataaagc 3600
tgcacaggat tcccatctac cctgatgatg cagcagacat cattcaatcc aaccagaatc 3660
tcgctctgtc actcaggctg g 3681

<210> 464

<211> 1424

<212> DNA

<213> Homo sapiens

<400> 464

tccgagctga ttacagacac caaggaagat gctgtaaaga gtcagcagcc acagccctgg 60
ctagctggcg ctgtgggcat ttattagtaa agttttaatg acaaaagctt tgagtcaaca 120
caccctgggg taattaacct ggtcatcccc accctggaga gccatcctgc ccatgggtga 180
tcaaagaagg aacatctgca ggaacacctg atgaggctgc acccttggcg gaaagaacac 240
ctgacacagc tgaaagcttg gtggaaaaaa cacctgatga ggctgcaccc ttggtggaaa 300
gaacacctga cagggctgaa agcttgggtg aaaaaacacc tgatgaggct gcatccttgg 360
tggaggggaa atctgacaaa attcaatgtt tggagaaagc gacatctgga aagttcgaac 420
agtcagcaga agaaacacct agggaaatta cagtcctgc aaaagaaaca tctgagaaat 480
ttacgtggcc agcaaaagga agacctagga agatcgcatg ggagaaaaaa gaagacacac 540
ctaggggaaat tatgagctcc gcaaaagaaa catctgagaa atttacgtgg gcagcaaaag 600
gaagacctag gaagatcgca tgggagaaaa aagaaacacc tgtaaagact ggatgctgg 660
caagagtaac atctaataaa actaaagttt tggaaaaagg aagatctaag atgattgcat 720
gtcctacaaa agaatcatct acaaaagcaa gtgccaatga tcagagggtc ccatcagaat 780
ccaaacaaga ggaagatgaa gaatatctt gtgattctcg gagtctctt gagagtctg 840
caaagattca agtgtgtata cctgagtcta tatatcaaaa agtaatggag ataatagag 900
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tcccaccaga atccaaacaa aaggactatg aagaaaattc ttgggattct gagagtctc 1080
gtgagactgt ttacagaag gatgtgtgtt tacccaaggc tacacatcaa aaagaaatag 1140
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aatatttctc taaactgatg aggagggata tcctctagta gctgaagaaa attacctcct 1260
aaatgcaaac catggaaaaa aagagaagtg caatggctcg aagttgtatg tctcatcagg 1320
tgttggcaac agactatatt gagagtgctg aaaaggagct gaattattag tttgaattca 1380
agatattgca agacctgaga gaaaaaaaaa aaaaaaaaaa aaaa 1424

<210> 465

<211> 674

<212> DNA

<213> Homo sapiens

<400> 465

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ggctagctgg ccctgtgggc atttattagt aaagttttaa tgacaaaagc tttgagtcaa 120
cacacccgtg ggtaattaac ctggatcatc cacccttggg gagccatcct gcccatgggt 180
gatcaaagaa ggaacatctg caggaacacc tgatgaggct gcacccttgg cggaagaac 240
acctgacaca gctgaaagct tgggtggaaaa aacacctgat gaggctgcac ccttgggtgga 300
aagaacacct gacacggctg aaagcttgggt ggaaaaaaca cctgatgagg ctgcatcctt 360
ggtggaggga acatctgaca aaattcaatg tttggagaaa ggcacatctg gaaagttcga 420
acagtcagca gaagaaacac ctagggaatg tacgagtcct gcaaaagaaa catctgagaa 480
atttacgtgg ccagcaaaaag gaagacctag gaagatcgca tgggagaaaa aagatgactc 540
agttaaggca aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa 600
aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa 660
aaaaaaaaaa aaaa 674

<210> 466

<211> 1729
<212> DNA
<213> Homo sapiens

<220>
<221> unsure
<222> (11)
<223> n=A,T,C or G
<221> unsure
<222> (1128)
<223> n=A,T,C or G

<400> 466
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catctgagaa atttacgtgg ccagcaaaaag gaagacctag gaagatcgca tgggagaaaa 120
aagaagacac acctagggaa attatgagtc ccgcaaaaaga aacatctgag aaatttacgt 180
gggcagcaaa aggaagacct aggaagatcg catgggagaa aaaagaaaca cctgtaaga 240
ctggatgctg ggcaagagta acatctaata aaactaaagt tttggaaaaa ggaagatcta 300
agatgattgc atgtcctaca aaagaatcat ctacaaaagc aagtgccaat gatcagaggt 360
tccccatcaga atccaaacaa gaggaagatg aagaatattc ttgtgattct cggagtctct 420
ttgagagttc tgcaagatt caagtgtgta tacctgagtc tatatatcaa aaagtaatgg 480
agataaaatag agaagtagaa gagcctccta agaagccatc tgccttcaag cctgccattg 540
aaatgcaaaa ctctgttcca aataaagcct ttgaattgaa gaatgaacaa acattgagag 600
cagatccgat gttcccacca gaatccaaac aaaaggacta tgaagaaaat tcttgggatt 660
ctgagagttc ctgtgagact gtttcacaga aggatgtgtg tttacccaag gctacacatc 720
aaaaagaaat agataaaata aatggaaaat tagaagagtc tcctaataaa gatggtcttc 780
tgaaggctac ctgcggaatg aaagtttcta ttccaactaa agccttagaa ttgaaggaca 840
tgcaaaacttt caaagcagag cctccgggga agccatctgc cttcgagcct gccactgaaa 900
tgcaaaagtc tgtcccaaat aaagccttgg aattgaaaaa tgaacaaaca ttgagagcag 960
atgagatact cccatcagaa tccaaacaaa aggactatga agaaaattct tgggatactg 1020
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aagaataga taaaataaat ggaaaattag aagggtctcc tggtaaanat ggtcttctga 1140
aggctaactg cggaatgaaa gtttctatct caactaaagc cttagaattg atggacatgc 1200
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<210> 467
<211> 1337
<212> DNA
<213> Homo sapiens

<400> 467
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<210> 468

<211> 2307

<212> DNA

<213> Homo sapiens

<400> 468

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<210> 469

<211> 650

<212> PRT

<213> Homo sapiens

<220>

<221> unsure

<222> (310)

<223> Xaa = Any Amino Acid<221> unsure

<222> (429)

<223> Xaa = Any Amino Acid<221> unsure

<222> (522)

<223> Xaa = Any Amino Acid

<400> 469

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Gly	Arg	Pro	Arg	Lys	Ile	Ala	Trp	Glu	Lys	Lys	Glu	Thr	Pro	Val	Lys	20	25	30
Thr	Gly	Cys	Val	Ala	Arg	Val	Thr	Ser	Asn	Lys	Thr	Lys	Val	Leu	Glu	35	40	45
Lys	Gly	Arg	Ser	Lys	Met	Ile	Ala	Cys	Pro	Thr	Lys	Glu	Ser	Ser	Thr	50	55	60
Lys	Ala	Ser	Ala	Asn	Asp	Gln	Arg	Phe	Pro	Ser	Glu	Ser	Lys	Gln	Glu	65	70	75
Glu	Asp	Glu	Glu	Tyr	Ser	Cys	Asp	Ser	Arg	Ser	Leu	Phe	Glu	Ser	Ser	85	90	95
Ala	Lys	Ile	Gln	Val	Cys	Ile	Pro	Glu	Ser	Ile	Tyr	Gln	Lys	Val	Met	100	105	110
Glu	Ile	Asn	Arg	Glu	Val	Glu	Glu	Pro	Pro	Lys	Lys	Pro	Ser	Ala	Phe	115	120	125
Lys	Pro	Ala	Ile	Glu	Met	Gln	Asn	Ser	Val	Pro	Asn	Lys	Ala	Phe	Glu	130	135	140
Leu	Lys	Asn	Glu	Gln	Thr	Leu	Arg	Ala	Asp	Pro	Met	Phe	Pro	Pro	Glu	145	150	155
Ser	Lys	Gln	Lys	Asp	Tyr	Glu	Glu	Asn	Ser	Trp	Asp	Ser	Glu	Ser	Leu	160		

143

165	170	175
Cys Glu Thr Val Ser Gln Lys Asp Val Cys Leu Pro Lys Ala Thr His		
180	185	190
Gln Lys Glu Ile Asp Lys Ile Asn Gly Lys Leu Glu Glu Ser Pro Asn		
195	200	205
Lys Asp Gly Leu Leu Lys Ala Thr Cys Gly Met Lys Val Ser Ile Pro		
210	215	220
Thr Lys Ala Leu Glu Leu Lys Asp Met Gln Thr Phe Lys Ala Glu Pro		
225	230	235
Pro Gly Lys Pro Ser Ala Phe Glu Pro Ala Thr Glu Met Gln Lys Ser		
245	250	255
Val Pro Asn Lys Ala Leu Glu Leu Lys Asn Glu Gln Thr Leu Arg Ala		
260	265	270
Asp Glu Ile Leu Pro Ser Glu Ser Lys Gln Lys Asp Tyr Glu Glu Ser		
275	280	285
Ser Trp Asp Ser Glu Ser Leu Cys Glu Thr Val Ser Gln Lys Asp Val		
290	295	300
Cys Leu Pro Lys Ala Xaa His Gln Lys Glu Ile Asp Lys Ile Asn Gly		
305	310	315
Lys Leu Glu Gly Ser Pro Val Lys Asp Gly Leu Leu Lys Ala Asn Cys		
325	330	335
Gly Met Lys Val Ser Ile Pro Thr Lys Ala Leu Glu Leu Met Asp Met		
340	345	350
Gln Thr Phe Lys Ala Glu Pro Pro Glu Lys Pro Ser Ala Phe Glu Pro		
355	360	365
Ala Ile Glu Met Gln Lys Ser Val Pro Asn Lys Ala Leu Glu Leu Lys		
370	375	380
Asn Glu Gln Thr Leu Arg Ala Asp Glu Ile Leu Pro Ser Glu Ser Lys		
385	390	395
Gln Lys Asp Tyr Glu Glu Ser Ser Trp Asp Ser Glu Ser Leu Cys Glu		
405	410	415
Thr Val Ser Gln Lys Asp Val Cys Leu Pro Lys Ala Xaa His Gln Lys		
420	425	430
Glu Ile Asp Lys Ile Asn Gly Lys Leu Glu Glu Ser Pro Asp Asn Asp		
435	440	445
Gly Phe Leu Lys Ala Pro Cys Arg Met Lys Val Ser Ile Pro Thr Lys		
450	455	460

Ala Leu Glu Leu Met Asp Met Gln Thr Phe Lys Ala Glu Pro Pro Glu
 465 470 475 480
 Lys Pro Ser Ala Phe Glu Pro Ala Ile Glu Met Gln Lys Ser Val Pro
 485 490 495
 Asn Lys Ala Leu Glu Leu Lys Asn Glu Gln Thr Leu Arg Ala Asp Gln
 500 505 510
 Met Phe Pro Ser Glu Ser Lys Gln Lys Xaa Val Glu Glu Asn Ser Trp
 515 520 525
 Asp Ser Glu Ser Leu Arg Glu Thr Val Ser Gln Lys Asp Val Cys Val
 530 535 540
 Pro Lys Ala Thr His Gln Lys Glu Met Asp Lys Ile Ser Gly Lys Leu
 545 550 555 560
 Glu Asp Ser Thr Ser Leu Ser Lys Ile Leu Asp Thr Val His Ser Cys
 565 570 575
 Glu Arg Ala Arg Glu Leu Gln Lys Asp His Cys Glu Gln Arg Thr Gly
 580 585 590
 Lys Met Glu Gln Met Lys Lys Lys Phe Cys Val Leu Lys Lys Lys Leu
 595 600 605
 Ser Glu Ala Lys Glu Ile Lys Ser Gln Leu Glu Asn Gln Lys Val Lys
 610 615 620
 Trp Glu Gln Glu Leu Cys Ser Val Arg Phe Leu Thr Leu Met Lys Met
 625 630 635 640
 Lys Ile Ile Ser Tyr Met Lys Ile Ala Cys
 645 650

<210> 470

<211> 228

<212> PRT

<213> Homo sapiens

<400> 470

Met Ser Pro Ala Lys Glu Thr Ser Glu Lys Phe Thr Trp Ala Ala Lys
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 Gly Arg Pro Arg Lys Ile Ala Trp Glu Lys Lys Glu Thr Pro Val Lys
 20 25 30
 Thr Gly Cys Val Ala Arg Val Thr Ser Asn Lys Thr Lys Val Leu Glu
 35 40 45
 Lys Gly Arg Ser Lys Met Ile Ala Cys Pro Thr Lys Glu Ser Ser Thr
 50 55 60

145

Lys Ala Ser Ala Asn Asp Gln Arg Phe Pro Ser Glu Ser Lys Gln Glu
 65 70 75 80
 Glu Asp Glu Glu Tyr Ser Cys Asp Ser Arg Ser Leu Phe Glu Ser Ser
 85 90 95
 Ala Lys Ile Gln Val Cys Ile Pro Glu Ser Ile Tyr Gln Lys Val Met
 100 105 110
 Glu Ile Asn Arg Glu Val Glu Glu Pro Pro Lys Lys Pro Ser Ala Phe
 115 120 125
 Lys Pro Ala Ile Glu Met Gln Asn Ser Val Pro Asn Lys Ala Phe Glu
 130 135 140
 Leu Lys Asn Glu Gln Thr Leu Arg Ala Asp Pro Met Phe Pro Pro Glu
 145 150 155 160
 Ser Lys Gln Lys Asp Tyr Glu Glu Asn Ser Trp Asp Ser Glu Ser Leu
 165 170 175
 Cys Glu Thr Val Ser Gln Lys Asp Val Cys Leu Pro Lys Ala Thr His
 180 185 190
 Gln Lys Glu Ile Asp Lys Ile Asn Gly Lys Leu Glu Gly Lys Asn Arg
 195 200 205
 Phe Leu Phe Lys Asn Gln Leu Thr Glu Tyr Phe Ser Lys Leu Met Arg
 210 215 220
 Arg Asp Ile Leu
 225

<210> 471
 <211> 154
 <212> PRT
 <213> Homo sapiens

<220>
 <221> unsure
 <222> (148)
 <223> Xaa = Any Amino Acid

<400> 471
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 5 10 15
 Trp Trp Lys Lys His Leu Met Arg Leu His Pro Trp Trp Lys Glu His
 20 25 30
 Leu Thr Arg Leu Lys Ala Trp Trp Lys Lys His Leu Met Arg Leu His
 35 40 45

146

Pro Trp Trp Arg Glu His Leu Thr Lys Phe Asn Val Trp Arg Lys Arg
 50 55 60
 His Leu Glu Ser Ser Asn Ser Gln Gln Lys Lys His Leu Gly Lys Leu
 65 70 75 80
 Arg Val Leu Gln Lys Lys His Leu Arg Asn Leu Arg Gly Gln Gln Lys
 85 90 95
 Glu Asp Leu Gly Arg Ser His Gly Arg Lys Lys Met Thr Gln Leu Arg
 100 105 110
 Gln Lys Lys Lys Lys Lys Lys Lys Lys Lys Lys Lys Lys Lys Lys Lys
 115 120 125
 Lys Lys Lys Lys Lys Lys Lys Lys Lys Lys Lys Lys Lys Lys Lys Lys
 130 135 140
 Lys Lys Lys Xaa Lys Lys Lys Lys Lys Lys
 145 150

<210> 472
 <211> 467
 <212> PRT
 <213> Homo sapiens

<220>
 <221> unsure
 <222> (329)
 <223> Xaa = Any Amino Acid

<400> 472
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 Gly Arg Pro Arg Lys Ile Ala Trp Glu Lys Lys Glu Thr Pro Val Lys
 20 25 30
 Thr Gly Cys Val Ala Arg Val Thr Ser Asn Lys Thr Lys Val Leu Glu
 35 40 45
 Lys Gly Arg Ser Lys Met Ile Ala Cys Pro Thr Lys Glu Ser Ser Thr
 50 55 60
 Lys Ala Ser Ala Asn Asp Gln Arg Phe Pro Ser Glu Ser Lys Gln Glu
 65 70 75 80
 Glu Asp Glu Glu Tyr Ser Cys Asp Ser Arg Ser Leu Phe Glu Ser Ser
 85 90 95
 Ala Lys Ile Gln Val Cys Ile Pro Glu Ser Ile Tyr Gln Lys Val Met
 100 105 110
 Glu Ile Asn Arg Glu Val Glu Glu Pro Pro Lys Lys Pro Ser Ala Phe

147

115	120	125
Lys Pro Ala Ile Glu Met Gln Asn Ser Val Pro Asn Lys Ala Phe Glu		
130	135	140
Leu Lys Asn Glu Gln Thr Leu Arg Ala Asp Pro Met Phe Pro Pro Glu		
145	150	155
Ser Lys Gln Lys Asp Tyr Glu Glu Asn Ser Trp Asp Ser Glu Ser Leu		
165	170	175
Cys Glu Thr Val Ser Gln Lys Asp Val Cys Leu Pro Lys Ala Thr His		
180	185	190
Gln Lys Glu Ile Asp Lys Ile Asn Gly Lys Leu Glu Glu Ser Pro Asn		
195	200	205
Lys Asp Gly Leu Leu Lys Ala Thr Cys Gly Met Lys Val Ser Ile Pro		
210	215	220
Thr Lys Ala Leu Glu Leu Lys Asp Met Gln Thr Phe Lys Ala Glu Pro		
225	230	235
Pro Gly Lys Pro Ser Ala Phe Glu Pro Ala Thr Glu Met Gln Lys Ser		
245	250	255
Val Pro Asn Lys Ala Leu Glu Leu Lys Asn Glu Gln Thr Leu Arg Ala		
260	265	270
Asp Glu Ile Leu Pro Ser Glu Ser Lys Gln Lys Asp Tyr Glu Glu Asn		
275	280	285
Ser Trp Asp Thr Glu Ser Leu Cys Glu Thr Val Ser Gln Lys Asp Val		
290	295	300
Cys Leu Pro Lys Ala Ala His Gln Lys Glu Ile Asp Lys Ile Asn Gly		
305	310	315
Lys Leu Glu Gly Ser Pro Gly Lys Xaa Gly Leu Leu Lys Ala Asn Cys		
325	330	335
Gly Met Lys Val Ser Ile Pro Thr Lys Ala Leu Glu Leu Met Asp Met		
340	345	350
Gln Thr Phe Lys Ala Glu Pro Pro Glu Lys Pro Ser Ala Phe Glu Pro		
355	360	365
Ala Ile Glu Met Gln Lys Ser Val Pro Asn Lys Ala Leu Glu Leu Lys		
370	375	380
Asn Glu Gln Thr Leu Arg Ala Asp Glu Ile Leu Pro Ser Glu Ser Lys		
385	390	395
Gln Lys Asp Tyr Glu Ser Ser Trp Asp Ser Glu Ser Leu Cys Glu		
405	410	415

148

Thr Val Ser Gln Lys Asp Val Cys Leu Pro Lys Ala Ala His Gln Lys
 420 425 430

Glu Ile Asp Lys Ile Asn Gly Lys Leu Glu Gly Lys Asn Arg Phe Leu
 435 440 445

Phe Lys Asn His Leu Thr Lys Tyr Phe Ser Lys Leu Met Arg Lys Asp
 450 455 460

Ile Leu
 465

<210> 473

<211> 445

<212> PRT

<213> Homo sapiens

<400> 473

Lys Glu Ile Asp Lys Ile Asn Gly Lys Leu Glu Gly Ser Pro Val Lys
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Asp Gly Leu Leu Lys Ala Asn Cys Gly Met Lys Val Ser Ile Pro Thr
 20 25 30

Lys Ala Leu Glu Leu Met Asp Met Gln Thr Phe Lys Ala Glu Pro Pro
 35 40 45

Glu Lys Pro Ser Ala Phe Glu Pro Ala Ile Glu Met Gln Lys Ser Val
 50 55 60

Pro Asn Lys Ala Leu Glu Leu Lys Asn Glu Gln Thr Leu Arg Ala Asp
 65 70 75 80

Glu Ile Leu Pro Ser Glu Ser Lys Gln Lys Asp Tyr Glu Glu Ser Ser
 85 90 95

Trp Asp Ser Glu Ser Leu Cys Glu Thr Val Ser Gln Lys Asp Val Cys
 100 105 110

Leu Pro Lys Ala Ala His Gln Lys Glu Ile Asp Lys Ile Asn Gly Lys
 115 120 125

Leu Glu Glu Ser Pro Asp Asn Asp Gly Phe Leu Lys Ala Pro Cys Arg
 130 135 140

Met Lys Val Ser Ile Pro Thr Lys Ala Leu Glu Leu Met Asp Met Gln
 145 150 155 160

Thr Phe Lys Ala Glu Pro Pro Glu Lys Pro Ser Ala Phe Glu Pro Ala
 165 170 175

Ile Glu Met Gln Lys Ser Val Pro Asn Lys Ala Leu Glu Leu Lys Asn
 180 185 190

Glu Gln Thr Leu Arg Ala Asp Gln Met Phe Pro Ser Glu Ser Lys Gln
 195 200 205
 Lys Lys Val Glu Glu Asn Ser Trp Asp Ser Glu Ser Leu Arg Glu Thr
 210 215 220
 Val Ser Gln Lys Asp Val Cys Val Pro Lys Ala Thr His Gln Lys Glu
 225 230 235 240
 Met Asp Lys Ile Ser Gly Lys Leu Glu Asp Ser Thr Ser Leu Ser Lys
 245 250 255
 Ile Leu Asp Thr Val His Ser Cys Glu Arg Ala Arg Glu Leu Gln Lys
 260 265 270
 Asp His Cys Glu Gln Arg Thr Gly Lys Met Glu Gln Met Lys Lys Lys
 275 280 285
 Phe Cys Val Leu Lys Lys Lys Leu Ser Glu Ala Lys Glu Ile Lys Ser
 290 295 300
 Gln Leu Glu Asn Gln Lys Val Lys Trp Glu Gln Glu Leu Cys Ser Val
 305 310 315 320
 Arg Leu Thr Leu Asn Gln Glu Glu Glu Lys Arg Arg Asn Ala Asp Ile
 325 330 335
 Leu Asn Glu Lys Ile Arg Glu Glu Leu Gly Arg Ile Glu Glu Gln His
 340 345 350
 Arg Lys Glu Leu Glu Val Lys Gln Gln Leu Glu Gln Ala Leu Arg Ile
 355 360 365
 Gln Asp Ile Glu Leu Lys Ser Val Glu Ser Asn Leu Asn Gln Val Ser
 370 375 380
 His Thr His Glu Asn Glu Asn Tyr Leu Leu His Glu Asn Cys Met Leu
 385 390 395 400
 Lys Lys Glu Ile Ala Met Leu Lys Leu Glu Ile Ala Thr Leu Lys His
 405 410 415
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 420 425 430
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 435 440 445

<210> 474

<211> 221

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(221)

<223> n = A,T,C or G

<400> 474

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tcagaagata gggcacagcc attgccttgg cctcacttga agggctctgca ttggggctcct 180
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